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The Right of Way for Toll Messages.

Failure to obtain the maximum possible revenue from the use of toll lines is frequently traceable to a mistaken idea of loyalty to the home company entertained by the toll operators. They manifest a disposition to give to business originating in their own exchange, or in other exchanges owned by the company by whom they are employed, preference over messages originating with other companies and switched through their boards. In this way poor service is given on messages covering long distances, and subscribers are deterred from future use of the toll lines on account of the delays additional to those arising from the number of exchanges through which they must pass, even under the best conditions. Not infrequently the management itself is at fault in giving operators instructions to award the preference to messages entirely in the company's own territory, on account of its getting the whole fee from the subscriber.

As a matter of fact it has been found to be good business to give the switched messages the preference, in order to stimulate the use of toll lines in general. The company which follows this practice can demand the same consideration from its connecting companies, and in this way assure itself of prompt service on all long haul, high return messages which it sends out, and in the long run reap as great advantages as it offers to its neighbors. Any narrow local view of long distance business is totally foreign to the principles under which it may be built up, and will so limit its growth as to drive away this source of most profitable revenue.

Inasmuch as the principal item of expense in giving toll service is involved in the annual charges upon the lines, the successful use of investments in toll plant involves the employment of operating methods which will keep the wires utilized for paid business throughout the greatest possible number of hours in the day. It is thus not only true that a company must educate its own subscribers to use its toll lines, but that it is obliged to encourage connecting companies to route messages over its wires. Where switched messages are neglected, business is driven away, and the circuits are tied up for many minutes in unprofitable wrangling between operators bidding for their use, and so the spirit of co-operation soon becomes utterly destroyed.

The Independent clearing houses have done extremely valuable work in preparing maps and routing instructions for messages in all the territory covered by their operations, and this information furnishes the proper basis for handling messages. In nearly every case there is not only a preferred routing, but a second and a third method of routing to the destination. Switched messages should be awarded the preferred routing in order to secure most rapid connection and best quality of transmission, as against the short haul messages originating at the home office. However, in case the preferred routing is occupied, there should be no delay in sending the switched message over the second or even the third routing, providing "commercial" transmission may be obtained, in order to give satisfactory service in point of speed.

Once the point of view of regarding their responsibility for making the circuits under their control pay is impressed upon the toll operators, with a few ideas about the business aspect of their work, their loyalty to the company can readily be diverted in profitable directions so that the time formerly spent in insisting upon their rights to preference in circuits is wisely employed, because such matters settle themselves. The efficiency of an operator is determined not at all by the proportion of out to through tickets, but by the amount, in dollars and cents, taken in over the circuits under her control. In general, it does not make nearly so much difference whether or not the collections are made by the man in her own exchange, if only the returns are high enough.

One Company or Two!

For years the Bell telephone company has been trying to re-establish such a monopoly as it formerly held, through the purchase of Independent telephone plants. It has bought hundreds of exchange systems, but in how many of the places where these sell-outs took place has the Bell company a monopoly today? Would there be even as many as there are now if some of the purchases had not been made just before the recent period of tight money set in? Answers to the preceding questions suggest another, viz., Is the campaign to give the various towns and cities of the country a monopoly service even an approximate success? These are questions which are constantly being presented to telephone men. In fact, as a rule, not only the questions but the answers are being furnished. Newspapers print matter bearing on the subject, in a form suggesting the conundrum book which supplies country youths with a cheap substitute for spontaneous wit.

These questions will never be answered by talking or writing answers which do not cover the entire solution; yet a telephone man must be interested in them, since they are so constantly agitated. In these days when Independent telephone men are being taken up in hot air balloons and shown the fertile fields of limited monopoly, it behooves these men to look into things a little bit, see how the straws point, and consider whether they would be really benefited by securing monopolistic privileges. Would they be much stronger than the great Bell telephone company at the time when it was not only the sole occupant of the telephone field, but was entrenched behind valuable patents on switchboards, etc., and able to bring to bear years of experience upon the solution of practical problems? Ever since then the idea that the telephone business is a natural monopoly has been before the public, but statistics shows the failure of the campaign for monopoly.

Here are a few cases bearing on the question which have come up within the past week or so.

At Elkhart, Indiana, the Bell telephone company proposed to retire, and upon its doing so the Independent company was to have a monopoly of the local business, and raise rates 50 cents per month. The Board of Public Works would not permit the raise, and the deal fell through.

The Chicago Telephone Company is trying to purchase the telephone rights of the Illinois Tunnel Company. Several leading Chicago newspapers see danger in such an act, and say so vigorously in their editorial columns. The Assembly of the State of Illinois has just killed a bill providing that one telephone company may purchase or own stock in another such corporation.

At Norfolk, Virginia, the question of consolidation and a rate increase, after having been rejected once, is now up for consideration. At Columbus, Georgia, suit has been entered by a minority stockholder to prevent such a merger.

At Galveston, Texas, citizens are threatening to start a new company because, as they claim, the old one is giving poor service. A raise in rates led to a movement for competition in Salisbury, Md. Pacific Coast papers publish a story to the effect that the Bell company there has found local business unprofitable and will retire, leaving the local company to raise its rates, restrict itself as to territory, and bind itself to buy Bell telephones and equipment, and also send all toll messages over the Bell lines, if it does not know that these exactions are only made where the local directorate shows that it cannot take care of itself in a trade. On the other hand the local paper at Woodland, California, apparently quoting a Bell official, says in regard to this report that, "Woodland is a very important link in the transaction of the long distance business of the company, and there is not the slightest probability that this exchange will be sold." Whoever heard of the Bell telephone company's selling a group of exchanges large enough to control both local and toll business in a considerable section of a state? Does it always hold the point that forms the keystone of such structures, or not? How long will the people of any place bear monopoly service and monopoly rates without complaint? Would any locally owned company work hard enough to deserve a monopoly if it should have one? How long would it take the people to find out if it were running behind in its service, or other details of its management, and start something unpleasant? Does a local company get any guarantee against future, locally owned competition when its present foreign competitor leaves the town? Why is every one ashamed to come out in the open and talk for the affirmative side of this question if it is right? We believe that the telephone business is like all others, wherein competition is essential to healthy development and the satisfaction of the public; but if any of our readers do not agree with us we should like to hear from them.

All-Concrete Conduit Construction

By S. B. Way

Chief Engineer, Union Electric Light & Power Co., St. Louis.

Cable conduits built entirely of concrete have been in use, or in process of construction, during the past three years in St. Louis.

During the year 1906 the electric light and power interests of that city found it desirable to install considerable conduit incidental to an extension of the system of distributing electricity.

A fairly large stock of multiple duct tile conduit was on hand, but there was not a sufficient quantity to supply the requirements of the work contemplated. An investigation of the conduit market developed a condition not at all encouraging to those responsible for the completion of the work in hand within the required time, in that all of the conduit manufacturers were then already sold out of the kind of duct desired. This state of affairs made it necessary for the engineers in charge of the work to choose between completing the work with such conduit as could be purchased and delivered within the time limit, or devising some means of building a conduit without the usual tile, or other pipe.

They chose to make an attempt to get along without the pipe, and incidentally save money in the cost of construction. This resulted in their building a conduit entirely of concrete.

Upwards of 170,000 duct feet of all-concrete, or monolithic conduit have been laid in St. Louis within the last three years, fulfilling every requirement for all uses of an electric light and power system, from single duct runs with frequent junction or service boxes, to replace Edison tube, to heavy isolated runs for high tension cable.

The ideal conduit, or housing, for underground conductors must have smooth, clear, jointless, fireproof duct openings, free from pockets or depressions in which water may lodge; should be laid to true grade to drain to manholes; must be constructed of a material of high electrical resistance, and which will be homogeneous and not deteriorate with age; must be strong and able to sustain itself and a considerable load over fairly long spans; and it must be cheap.

Fig. 1—Wooden Forms Set in Trench Ready for Concrete.

Fig. 2—Pouring and Tamping Concrete Over the Forms.

The most universally accepted practice, in this country, of constructing conduits of single or multiple clay tile, wood fiber, cement or iron pipe, with a jacket or supporting armor of concrete, obviously falls far short of the above stated requirements for ideal construction. Any of these methods of constructing ducts depends on the concrete armor for strength and ability to withstand the usual cuts, excavation and city improvements continually met with in the streets of large cities; and if the concrete armor is weakened or carelessly applied, the pipes of various kinds resemble beads strung upon a wire, and serve no useful purpose except to provide a hole or duct of uncertain size, smoothness and continuity between manholes.

In constructing a conduit with clay, or other pipe as a means of obtaining the duct openings, a bottom layer of concrete is thrown into the trench and leveled off, after which the pipe structure is built up on the concrete; necessitating the presence of workmen in the trench and the handling of a large amount of heavy material, which, even with the most careful methods, causes quantities of earth to be carried into the trench and deposited on the concrete, seriously interfering with the bond between the bottom layer of concrete and the sides and top of the concrete armor or envelope, and so materially weakening the structure. In laying the pipes it is necessary to use care to obtain perfect alignment and sealing. Each new section of pipe must be fitted to the preceding one, which jars or moves the pipe already laid to a greater or less extent, depending upon the skill of the workman and the quality of the material he is using. After the pipes are laid no absolute inspection of the ducts is possible, and the only information the owner can obtain relating to the presence of foreign matter, alignment, and sealing is derived from the passage of a short mandrel through the various ducts. Drawing a mandrel through a duct can do no more than demonstrate that there exists a hole sufficiently large and straight to permit the mandrel to pass through it. It is desirable in any conduit that the ducts be completely isolated from each other, and that the ducts be free from water-pockets or depressions, and present a large and smooth surface as a bed for the cable, in order that ground-currents may be equally distributed over the greatest possible area of the cable sheath, so that local electrolytic action may be minimized. Conduits built up of single duct tile or pipe offer greater isolation of individual ducts, but are more expensive to construct than conduits built up of multiple duct tile.

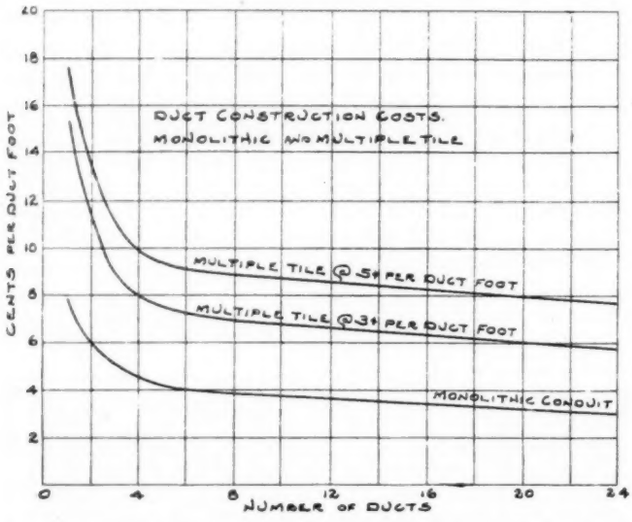


Fig. 3—Comparative Costs Per Duct Foot, Exclusive of Trenching, Refilling and Repaving.

It has been found that all-concrete, or monolithic conduit, possesses many advantages over a conduit built up of pipes of whatever nature, in that with such construction the structure becomes homogeneous; occupies less space for a given number of ducts of equal size; permits perfect inspection of each duct from end to end incidental to the laying of each tier; provides smooth, straight, clear, jointless and fireproof duct openings from manhole to manhole; eliminates handling, fitting, breakage and cost of pipe; requires no factory, and but few and simple special tools; and for average duct sections uses no more material (concrete) than is required for the armor or envelope of pipe construction. The amount of concrete per duct foot required for various duct sections for multiple duct tile and for monolithic conduit and the cost per duct foot of completed work, exclusive of trenching, refilling and repaving, are shown by curves in Figs. 3 and 8. These curves were plotted from results obtained in actually laying a considerable quantity of each type of conduit under the same supervision and by the same men, under control of the writer. The multiple duct tile was laid with a 3-inch armor of concrete, and with the interstices between the tiles filled with fine concrete; while the monolithic conduit was provided with 2½ inches of concrete between the ducts and the bottom and sides of the trench, with a cover or top 3 inches thick. The items of trenching, refilling and repaving are nearly constant for each type of conduit, except a small differential of about one-half cent per duct foot in favor of monolithic conduit due to the smaller trench and consequent reduced excavation and hauling of displaced earth required by the monolithic construction. Typical cross-sections of multiple duct tile and monolithic conduit are shown in Fig. 7.

Fig. 4—Leveling Off Top of Concrete with Tool from Outside the Trench.

Fig. 5—Workmen, Removing Duct Forms with Hooks, Do Not Enter the Trench.

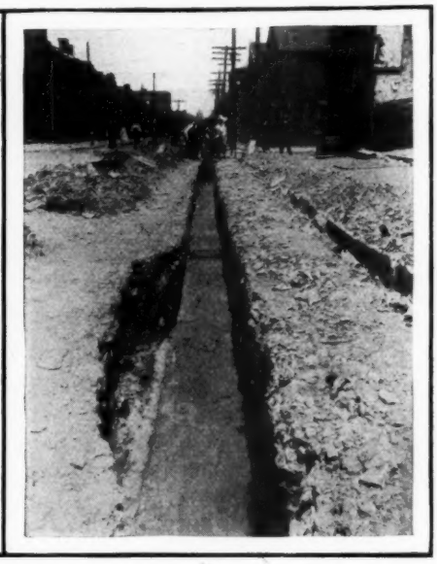


Fig. 6—Section of Completed Monolithic Conduit—Dark Lines Indicate an Open Hand-hole.

The construction of monolithic conduit involves only the comparatively simple methods of good concrete work.

After a trench of suitable width and depth has been excavated, duct form supports are set to grade and perfect alignment on 16-foot centers, in the bottom of the trench. These duct form supports serve to hold the forms, or moulds, for producing the duct openings, rigidly in place and in true alignment, while the concrete is worked into place in the bottom of the trench.

The duct forms, or moulds, consist of 16-foot sections of clear, straight grained lumber, previously dressed to the shape of a "U," and are held down in the duct form supports against the buoyancy of the plastic concrete by suitable weights of cast iron or other material.

When the duct forms are set, concrete of the proper mixture for good concrete work is dumped into the trench, and suitably rammed and puddled around the forms, and finally struck off level with the tops of the moulds. The concrete is then allowed to take its initial set, which in favorable weather requires about three hours, when the duct forms may be removed by simply lifting them upwards and out of the concrete; leaving smooth, straight, continuous, U-shaped grooves in the bed of concrete just laid which, when covered, constitute the duct openings.

Fig. 1 shows the trench with forms set ready for the concrete to be dumped in. Fig. 2 shows the method of introducing, tamping and puddling the concrete.

The manner in which the surface of the concrete is finished off level with the tops of the duct forms, without the necessity of workmen being present in the trench to disturb the concrete or introduce foreign material, is shown in Fig. 4. The manner of removing the duct forms from the concrete, at the same time avoiding the presence of workmen in the trench appears in Fig. 5.

After the duct forms are removed from the concrete, the smooth, continuous grooves moulded in the concrete by the forms are open to the daylight for the full length of the construction, and every possible facility is afforded for perfect and rapid inspection. Any faults in the work may be instantly detected, and this in itself is a potent factor in securing first-class work. Fig. 9 shows a tier of ducts immediately after removal of the duct forms, and ready for the addition of the top cover or the next layer of ducts, as may be desired.

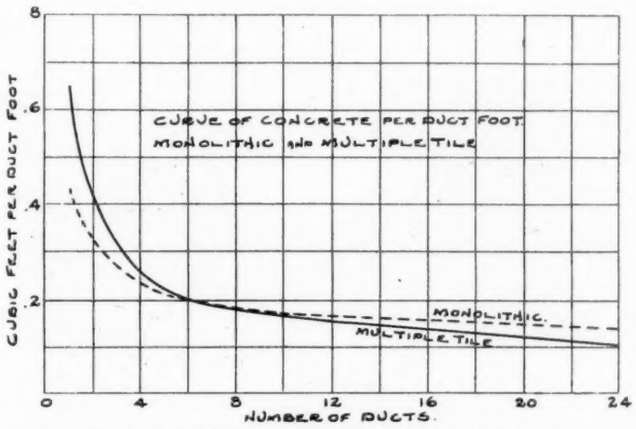


Fig. 8—Comparative Costs of Conduit Per Duct Foot for Monolithic and Multiple Tile.

The open top ducts, as illustrated in Fig. 9, are closed in by laying across the top of the structure thin, smooth, plates, or slabs, of concrete moulded on the site of the work, some of which are shown on the right-hand side of the picture. These slabs, or plates, of concrete are made of just sufficient width to lap over each outside duct a short distance, and are laid as illustrated in Fig. 11, with a small quantity of mortar to perfectly seal the joints. The thin concrete slabs, or plates, serve the double purpose of closing in the top of the newly formed ducts and as a foun-

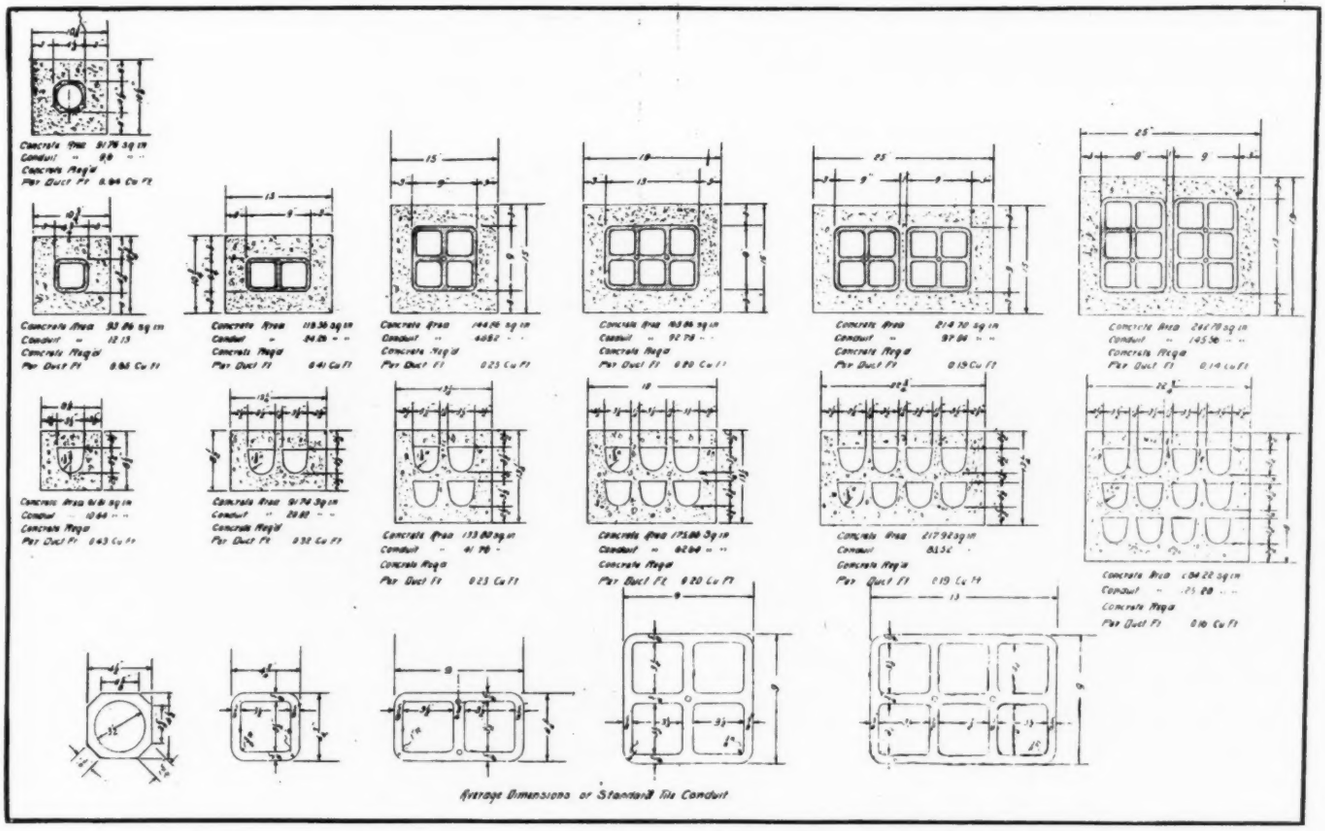


Fig. 7—Diagrams Showing Comparative Sizes of Tile and All-concrete Conduit with One to Twelve Ducts.

dation, or support, for the next layer of concrete in which an additional tier of ducts may be formed in the same manner as the preceding tier; this operation being repeated as often as necessary to produce the required number of duct openings. The top of the conduit is closed in in the same

Fig. 9—Tier of Ducts Immediately After Forms Have been Removed.

manner, with the exception that the top layer of concrete contains no duct forms, and acts simply as an armor or envelope to protect the conduit construction from future excavators.

In addition to its lower first cost and other important advantages, monolithic conduit is especially well adapted to be used as a conduit for local distribution. "Blind" handholes, or service boxes, are readily moulded in the concrete structure intercepting any desired number of ducts, as illustrated in Fig. 10. In moulding these handholes, or service boxes, the duct forms are allowed to pass through, and the concrete flowing around the duct forms is stopped off by suitable forms arranged to fit closely around the duct moulds. Such handholes or service boxes can be installed at as frequent intervals as desired without increasing the cost of the construction, inasmuch as no additional material is required. The top of the handhole, or service box, is closed in after the conduit is finished by a suitable cast iron or concrete cover, made loose so as to be readily removed in case it is desired to open the box for taking off services. A section of completed monolithic conduit is shown in Fig. 6, with a handhole, or service box, open ready for the placing of its cover.

Monolithic conduit has been laid under a great variety of street conditions, and during all seasons of the year, with perfect success and with a material saving in cost over the various pipe methods of duct construction.

Contract Men Must Go Into Details.

People who have never had telephone service seldom know what they need, and frequently are ignorant of the many special terms regularly used by the telephone men.

"A man came into the Exeter, N. H. Exchange," says *New England Telephone Topics*, "and stated that he wanted a telephone in his house. The following conversation took place between the representatives of the telephone company and the prospective subscriber:

"'What kind of service do you want?'

"'I don't know what you mean.'

"'Well, do you want a private line, a two-party line or a six-party line?'

"'There are only two of us, my wife and myself, so that, of course, it will have to be a two-party line.'"

Commenting on this incident, the editor of the paper says:

"This may seem a joke to the contract agent over whose tongue ripple technical phrases as smoothly as the water in the brook over the stones. It illustrates, however, the lack of technical information on the part of the subscribers and the need of explaining even elementary phrases. Beware of talking 'telephonese.'"

The Michigan Managers' Meeting.

Bright young women operators were much in evidence at the convention of Independent telephone managers held at Muskegon, Mich., last week. Managers of the leading telephone companies and of nearly one hundred exchanges were present, too, but the fair sex was so prominent that the gathering resembled a teachers' institute at times.

H. T. Clough, of Owosso, president of the association, was unable to be present, and at the request of Vice-president A. A. Burch, of Battle Creek, Past President F. V. Newman, of Grand Rapids, presided. Mr. Newman

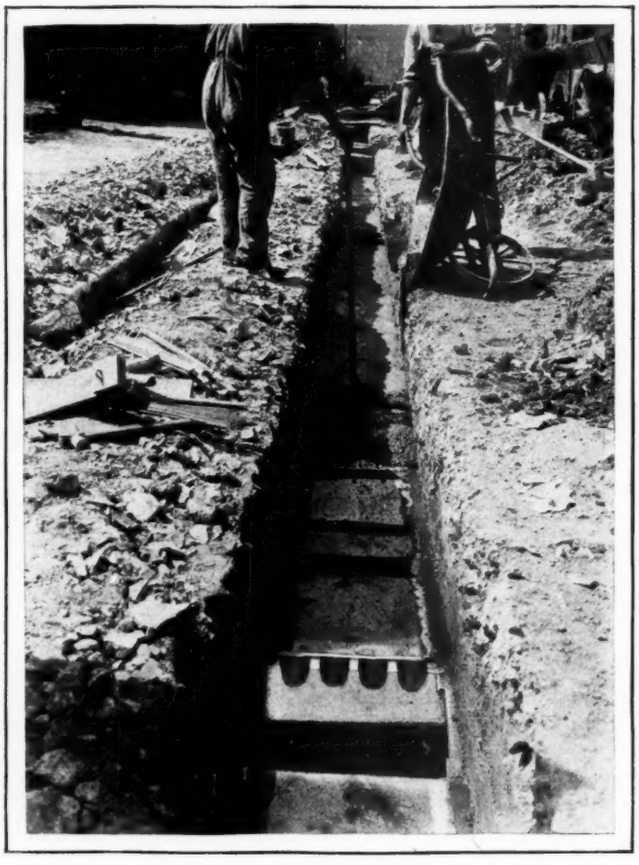


Fig. 10—Hand-hole Made by Stopping Trench with Suitable Forms.

seemed to know every operator and manager in the convention and made a most genial presiding officer.

C. E. Tarte, of Grand Rapids, who appeared to TELEPHONY's correspondent as a veritable encyclopedia of telephonic information, was one of the busiest men on the floor during

the first day, but failed to show up at the second session. Finally it was revealed that he had gone home to welcome a new daughter. The young lady was at once adopted by the convention, which ordered the name of Elizabeth Tarte enrolled on the honorary membership list.

Papers of interest to managers and to operators were read.

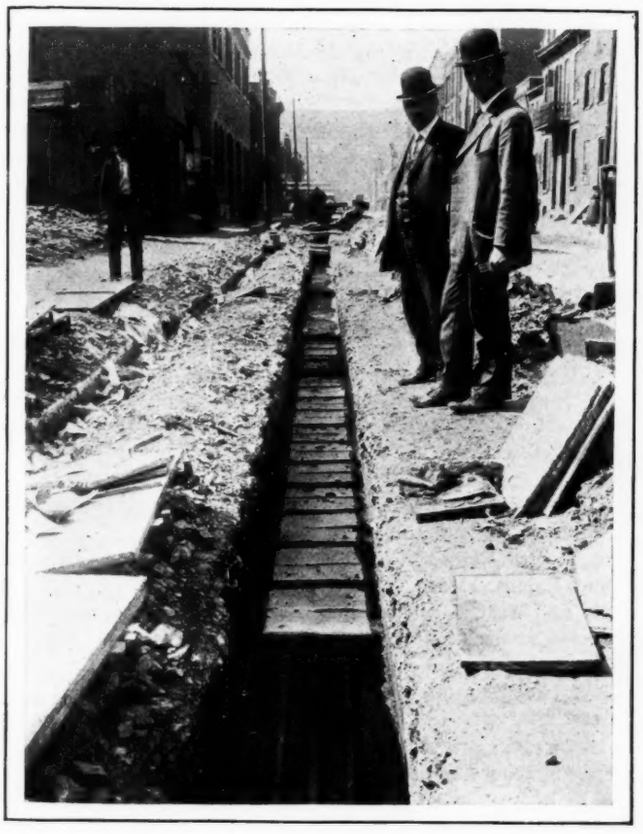


Fig. 11—Concrete Cover Plates Laid Over Ducts—Joints Sealed with Mortar.

Miss Floy Egan, of Alma, gave some excellent hints regarding "Accuracy and Promptness of Reports to General Offices."

"Collections" was the theme of R. I. Briggs, manager of the Citizens' Telephone Company at Fremont, who has made a state reputation as a collector. He explained how easy it is to secure your own if you only understand the game.

Mr. Briggs said:

"Collections in many instances were much behind when I went to Fremont, but I lost no time in getting after the delinquents, and we now have a practically clean list. Some of those who owed $15 to $20 I induced to go to the bank and borrow the money to pay up.

"Education of the subscriber is the first step in promoting prompt payments. Begin at the beginning by exacting the first rental in advance, and he will feel that it is a cash in advance proposition. Managers should look up prospective customers.

"The Fremont system includes over thirty farmers' companies, which are organized together as the United Telephone companies. To the secretary of the United companies we look for the collection of rentals, notifying him promptly at the beginning of each quarter. Then he sees that the companies pay, settling when the collections are made, at Fremont. Usually payments are exceedingly prompt.

"Long distance accounts are settled from Fremont, subscribers being notified directly from the central office by telephone.

"I find that by watching for the arrival of farmers in town on Saturday I can make many 'long distance' collections."

P. B. Orth, of Grand Rapids, told how he wrestled with ancient bills, relics of has-been subscribers. The "Routing of Long Distance Traffic" was the subject discussed by Mrs. Florence Gould, of Battle Creek.

This paper brought on a lively discussion as to whether the originating office should route the message to its destination or responsibility should shift from switching station to switching station. This subject also came up during the discussion of a paper on "Conditions the Long Distance Operator Faces," by Miss Grace Bower, toll operator at Muskegon.

W. S. Vivian, manager of the Michigan Traffic Association, took the ground that the originating office should monitor the call to its destination, and that it was up to the companies to make provisions for carrying out such a policy.

Mr. C. E. Tarte, general manager of the Citizens' company, of Grand Rapids, who fought valiantly against the ad valorem tax bill passed by the legislature recently, contributed a paper on that subject which was read in his absence. It was agreed that if all property was assessed at cash value, as the state law provides, it would make little difference whether the ad valorem or the specific system prevailed. However, in Michigan the rate varies much between municipalities, and it was estimated that the average was not much over 60 per cent of the actual valuation.

Stockholders were comforted by S. E. Fisher, of Detroit, assistant to the general manager of the Inter-State Long Distance Telephone Company, who said that in states where the ad valorem system of taxation was adopted, the assessing officers were in the habit of accepting the valuation placed on lines by the companies.

Mr. Fisher also read a paper, "Why Should Long Haul Messages Have Precedence Over Short Haul?" in which he contended that this policy meant business development in a broad way.

Mr. Fisher said:

"When we say that long distance messages should have a preference over short haul messages we are talking particularly to and directly at the switching operator. It does not necessarily mean that the haul is extremely long, but that it is being hauled a greater distance from the first or any intermediate switching station, and is consequently of more value to the company from a monetary standpoint, and is presumably of greater value to the calling party, who considers his business of such importance that a personal conversation is necessary.

"As an illustration I cite this supposititious case: Muskegon calls Toledo through Grand Rapids and Detroit. 'First come, first served' is a good business motto generally, but in this case the Muskegon call should have precedence over calls on the direct line from Grand Rapids to Detroit.

"The operator should complete a ticket on this call at once regardless of the number of uncompleted tickets between Grand Rapids and Detroit. She should not require Muskegon to call again before connection is established, thus taking up the time of the Muskegon operator, with the possible loss of a call, and also interfering with the switching operations at Grand Rapids and Detroit with repeated orders for the same connection.

"The more switching offices a call passes through the greater necessity of giving the originating office the right of way, thus lessening the work of all operators concerned, and reducing the use of all lines over which such call passes to the minimum.

"Vast sums of money are invested and only by reducing the unproductive or operating use of lines to the lowest possible limit, together with proper routing, can they be made productive.

"I have in mind a call put in at Detroit recently for a point 200 miles distant. Reports on the call showed that Detroit had to build up the circuit to the last switching point only to be told that all lines were busy. Finally, after a three hours' wait the subscriber told Detroit to ask the last switching point whether we were or were not going to get through, and the report came back that the latter had four tickets herself for that point and that when she completed these we could get a circuit.

"How absolutely absurd it is to attempt to do business under such circumstances! It positively was the duty of that last switching operator, after we had gone to all the work to build up a circuit to her, to complete the connection for us, after which she could readily have completed her comparatively short hauls.

"And why not? There was just as much revenue in the Detroit call for the company that employed her as from one of her own calls, and a revenue besides for all connecting companies, yet her evident desire to cater to her own subscribers caused a loss of revenue from other calls, on account of busy lines to every company which had anything to do with handling that call.

"Really long distance business is very much in a minority and should be encouraged. We have the lines and equipment. Get the business!

"Only 1.93 per cent of every 100 messages, according to figures prepared by a long distance company, are over 100 miles and less than 120; 2.37 per cent are from 120 to 140; .3 of one per cent, 140 to 160 miles, and .4 of one per cent cover still greater distances.

"Operators, regardless of the size of the exchange, should not feel that they are simply part of the local, but rather part of a big and growing national independent telephone service, and encourage its development as a whole."

"Cost of Furnishing Toll Service" and "Side Lights on Exchange Operating" were interesting papers read respectively by A. A. Burch, manager at Battle Creek, and W. J. Geisel, traffic manager at Muskegon.

The session concluded with a question box in charge of J. P. Badour, of Allegan, Miss Charlotte Smith, of Muskegon, and Miss Bessie Bottomley, of Cadillac.

Wednesday evening the convention dined at the Lake Michigan Park Pavilion, when John Q. Ross, president of the Muskegon Chamber of Commerce, Hon. E. B. Fisher, of Grand Rapids, and Frank G. Jones, president of the American Electric Fuse Company, Muskegon, responded to toasts.

William Robinson, manager of the Citizens' company, of Muskegon, was chief host of the convention, and was ably seconded by his corps of employes.

Mr. Tarte at one point in the first day's session said:

"Always insist on a contract. Occasionally there are people who refuse for one reason or another, perhaps because they imagine it is impugning their integrity, but if you give in to them their neighbors soon find out and insist on the same deal. When we put the system in at Lake Odessa, Mich., one 'rebel' refused to sign, but after we put in 356 telephones on central, and he had thought about it two weeks, he sent word that he would sign, saying he guessed he was 'no better than any other man.'"

B. P. Orth, special collector, Citizens' Telephone Company, Grand Rapids, said:

"I find that local attorneys collect old accounts more successfully than collection agencies. Many do not like the idea of meeting an attorney who knows about their delinquency, and they think he may tell others."

Mrs. Florence Gould, chief operator, Citizens' company, Battle Creek, said for the benefit of other operators:

"Spend your spare time studying maps and you will be able to do your work more expeditiously."

History of the Automatic Telephone*

The Lorimer System

By Arthur Bessey Smith

Assistant Professor in Telephone Engineering, Purdue University.

Probably no other part of telephone history contains a parallel to the development of the Lorimer system, arising as it does from the skill of the three brothers, who worked courageously and consistently for ten years before producing a working system.

George W. Lorimer was born April 15, 1874, at St. George, Ontario, Canada. His brother, James Hoyt Lorimer, was born in 1876, while the youngest brother, Egbert S. Lorimer, was born in 1880. Their father was owner of a sash and blind factory, also making a clothes wringer, the patent on which he owned. George, even when very young, showed a mechanical tendency, being interested in the steam engine and water wheel which ran the factory. At the age of 12 he made a working steam engine. Both George and Hoyt received a good common school education, also a high school course at Scotland, Ontario. Hoyt was started into the study of law, while George, in the spring of 1888, left school and took the examination for teacher's certificate. Failing in but one subject, bookkeeping, his father insisted that he learn it perfectly, and he was sent to the Brantford Commercial College, from which he graduated in 1889. He at once secured a position with a firm in Bay City, Mich. In the spring of 1891 his father died and, acceding to his mother's desire to have him nearer home, George left the Bay City firm. Not liking bookkeeping he started to learn telegraphy in a railroad office in the fall of 1891, in his home town, St. George. While learning to be an operator he studied "Freight and Tickets" in addition, so that from the spring to fall of 1892 he was employed as relieving agent.

During this time Hoyt had been pursuing law after a fashion, but he was much more interested in electricity than in dry books and nice points in equity. Finally, because he persisted so much in making electrical experiments in the law office, his employer told him that he was not cut out for the study of Blackstone.

There was in the city of Brantford a music teacher named Romaine Callender. He was an ingenious man, and of an enthusiastic temperament. He had located in Brantford years ago. In connection with his musical work he had invented an organ player, the patent on which he sold for $200. His

attention was directed toward the telephone as a field for his activities, and he began the invention of an automatic switchboard.

As soon as Hoyt Lorimer was told of the futility of the study of law he went at once to Mr. Callender and offered his services in the experimental shop. To his delight he was accepted, and set to work in the shop on Dufferin avenue, making parts of the apparatus. Hoyt soon became infatuated with this work, and induced his brother George to leave his railroad work and enter Mr. Callender's employ. The latter was glad to get the additional assistance of one who had the practical experience of a telegraph operator.

CALLENDER'S FIRST SYSTEM.

The general features of the system on which Mr. Callender was at this time working are shown by Fig. 128. It would be useless to go into the details, as they are complicated and for the most part uninteresting. At the middle of the top of the figure are the subscribers' lines, which are of the single wire ground return type. All these lines pass through the general circuit breaker, to the banks of switches or circuit selectors. Each line is also connected through the "isolator" at the left to a single switch, called the "numerical receiver No. 1." The substation, Fig. 129, was equipped with a battery, *BA*, and an impulse transmitting cylinder, *T*. Each of the bars, *a*, was connected through the brush, *y*, to battery. The switch lever, *Sw*, was connected to line 1, leading to the office. By mere inspection of Fig. 129 it will be seen that if the switch lever, *Sw*, be placed on any of its contacts, from 0 to 9, and the crank *H* be turned one revolution, there will be a certain number of impulses sent over the line to "Central."

By placing the switch at *O* and sending thus one preliminary impulse, the isolator (Fig. 128) severs all lines except the one calling. A series of impulses now sent from the substation will actuate the numerical receiver No. 1, rotating it by a magnet and ratchet to the desired point. From here on Mr. Callender's scheme is vague and unsatisfactory. He intended to have all numbers from 1 to 9 called by means of

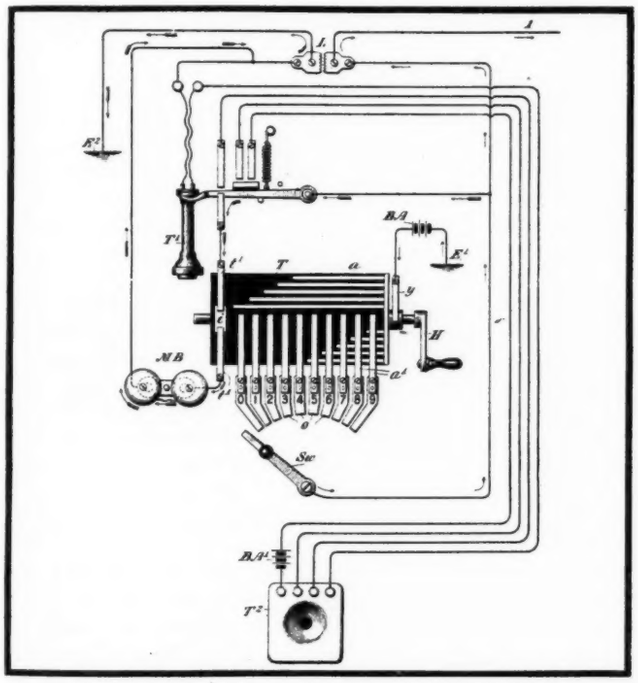


Fig. 129—The Substation of the Callender System.

numerical receiver No. 1 only, yet to have this same switch pick out any one of the second series (numerical receiver No. 2) or third series (numerical receiver No. 3) to get numbers as high as 999. As shown in the figure, this is impossible. Without rehearsing the details of the apparatus, the following summary will show the main points:

1. Ground return subscribers' lines.
2. Local battery for selecting.
3. Free use of relays and magnets.
4. Only one subscriber could use the apparatus at a time,

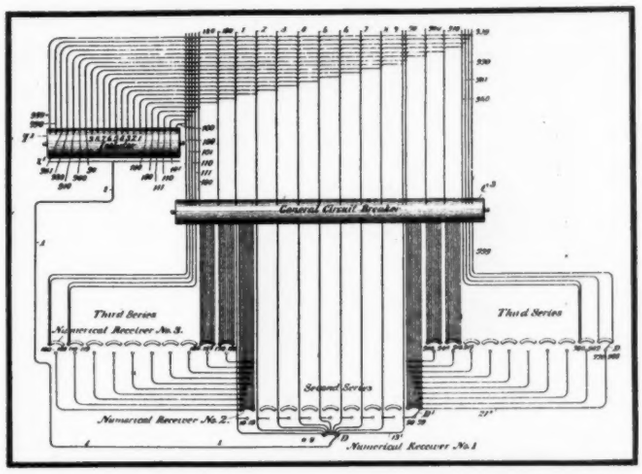


Fig. 128—General Features of the First Callender System.

since all calls from the entire exchange had to use numerical receiver No. 1. All others would have to wait until he got through talking.

5. The release was to be automatic at the end of a fixed time, determined by a clock, and not under the control of the subscriber. However, he could release before, if he got through.
6. The ringing was to be done automatically.
7. Complication was added to complication to secure simple results. He seems to have had the idea of doing everything by time-limit, even where not needed.
8. The talking circuit had to pass through one relay.
9. He had the idea of primary and secondary switches, but the idea was not worked out into a consistent system.

During the spring of 1893 Mr. Callender devised a new form of time limit, employing a vibrating mechanism which was intended to act as a circuit changer when it came to rest. It was of doubtful utility.

CALLENDER'S SECOND SYSTEM.

He also devised another system (in the spring of 1893) in which for the first time was embodied the percentage idea, that is, the idea of providing only enough apparatus to perform the switching at the busy hour, and placing it at the disposal of any subscriber in the system. He also proposed to use metal balls to complete the actual connection, the selectors merely carrying and directing the balls along the desired channels or runways. After performing this act, the selector was to revert to the use of any other subscriber. The main features were as follows:

1. Two-wire system—no earth return.
2. Local battery selecting.
3. The percentage idea.
4. Circuit selectors not to make the connections, but to swing around and deliver metal balls to runways, the balls rolling along to a pocket where they dropped onto plates and connected the lines.
5. Constantly rotating percentage circuit selector, to be seized by any one of the subscribers and made to give a circuit selector into the control of the subscriber.
6. Circuit selectors to revert to common use after discharging the balls.
7. Primary and secondary circuit selectors. The former were to pass balls to any one of the latter, and the latter to pick out the proper runway and deliver the balls to it.

8. Limited size, due to the form of connecting board. This was similar in plan to the telegraph switchboard used at way stations, except that the balls made the connection between the intersecting conductors instead of pins.

The World's Columbian Exposition was set to occur at Chicago during the summer of 1893, and the men who were backing Mr. Callender desired to have a working exhibit there.

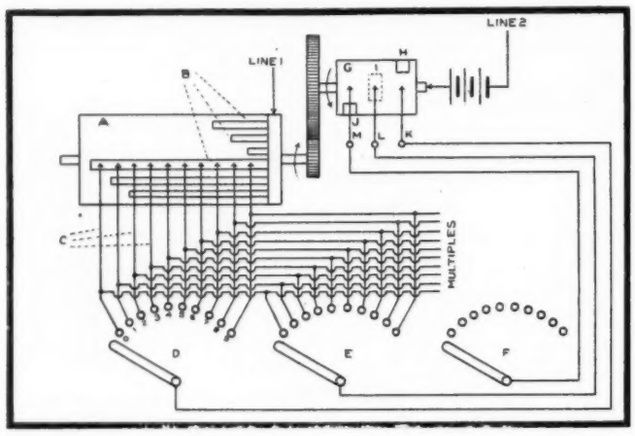


Fig. 130—Callender's Signal Transmitter.

This he promised to do, intending to use the above system. But the machine was an utter failure, and was abandoned before completion.

The money for the experiments had been furnished by two of his friends, Dr. E. Hart and Mr. Gould. During the summer of 1893 their money began to be scarce, so all of the men were laid off except Hoyt Lorimer. George was to be re-employed as soon as conditions became better.

Finding that the ball idea did not work out for connections, a new circuit selector was devised to make the contact directly. A magnet on a revolving shaft was made to lift any one of a series of contacts and make it touch an interconnecting ring. After this, the revolving magnet could go on for other calls. A new signal transmitter was also produced, which is of interest in relation to the later work of the Lorimers. The object was to get up a device which would automatically send in the required number of impulses for each digit in the call number, after being set by the user. Its principles are shown in Fig. 130. *A* is a drum on whose surface are metal bars, *B*, of varying length. *C* are brushes resting on the cylinder, each brush being connected to one contact of the switch *D*. The contacts of the other switches, *E* and *F*, are multipled to those of *D*, point for point, as indicated. *G* is another insulating cylinder geared to *A* by a 3 to 1 gearing, *G* moving the more slowly. The contact segments *H*, *I*, and *J*, are connected through battery to line No. 2. The brushes *K*, *L*, and *M*, are wired separately to the switch arms D, E and F, respectively.

The subscriber sets each of the switches *D*, *E* and *F*, to the proper digit values of the number he desires. He then pulls a chain or lever which winds up a spring. When released this spring, regulated by a governor, drives the cylinders *A* and *G*, around in the direction arrowed. During the first revolution of *A* the brush *K* is in contact with *H*, so that the number of impulses sent will depend on the position of *D*. During the second revolution of *A*, cylinder *G* will have turned so that segment *I* touches brush *L* and the impulses sent in will be fixed by the position of *E*. In the same way the last series of impulses is fixed by *F*.

After being laid off by Mr. Callender, George Lorimer was for a time at his home at St. George, but Jan. 1, 1894, he started in electrical business for himself in Brantford, putting in intercommunicating telephone systems, electric bells and annunciators, and also selling supplies. At this time he invented an automatic switch return for the intercommunicating system.

(To be continued.)

Good Advertising in These Verses!

Following are a few lines from a contribution to a Battle Creek, Michigan, newspaper:

WHAT WE OWE HER.

The telephone girl sits still in her chair
And listens to voices from everywhere.
She hears all the gossip,
She hears all the news,
She knows who is happy
And who has the blues;
She knows all our sorrows,
She knows all our joys,
She knows every girl
Who is chasing the boys;
She knows of our troubles,
She knows of our strife,
She knows every man
Who is mean to his wife.
In fact, there's a secret 'neath each saucy curl
Of that quiet, demure-looking telephone girl.
If the telephone girl would tell all she knows,
It would turn half our friends into bitterest foes;
She would sow a small wind that would soon be a gale,
Engulf us in trouble and land us in jail.
Now doesn't it make your head whirl
When you think of the telephone girl?
—By a Battle Creek Telephone Girl.

Now it so happens that Battle Creek has an Independent company which uses automatic equipment, and one of its strong claims is "secret service." The night switchman in the automatic exchange is a pretty good manipulator of the English language himself, and, moreover, was quick enough to seize an opportunity to give the company a "boost" when it came his way. Here is his production as printed in the same paper:

REPLY TO A BATTLE CREEK TELEPHONE GIRL BY A BATTLE CREEK TELEPHONE BOY.

A rhymer has told of the telephone girl
Who listens to all you may say;
And pictures in rhyme your danger and peril
If your secrets she would give away.
She is as good as can be, the telephone maid,
She never may tell what she knows;
But what would become of some plans that are laid
If she talks (as some do), we suppose?
She knows of your troubles,
And all of your cares,
And she might let them slip
In a way unawares.
Why give her the chance when a much better way
Of saving your secrets is offered to-day?
A telephone service where maids do not shine
Nor centrals get saucy, The Self-Calling Line.

Not all the best advertising of the telephone bears the name. When Independent companies have employees who realize what constitutes real advertising as well as the night switchman at Battle Creek, they are pretty sure to get the business.

"Modern Samson" Puts Cable Out of Business.

The feat of a traveling showman, who was heralded as the "modern Samson" and whose specialty was a weight-pulling contest against a team of horses has cost the Richmond (Ind.) Home Telephone Company nearly $1,000 and has been the cause of great annoyance to several hundred telephone subscribers. The "modern Samson" appeared on a street corner several weeks ago, and in order to install his pulling equipment properly, he drove an iron stake into the ground several feet. From that moment until a few days ago the wire chief at the office of the Home Telephone Company has been endeavoring to locate the trouble in one of their big telephone cables.

The showman's iron stake was not only driven into the ground, but it was also driven entirely through a concrete conduit through which passed several cables. An concrete conduit through which passed several cables. An investigation proved that one of these cables was almost cut in two, and it had to be removed and a new section spliced in.

Central Office Locations*

By S. D. Levings

A positive application of the rule for determining a location where obstacles occur has been illustrated, and, for the sake of clearness, let a case be assumed that will involve the negative use of the rule. Assume a condition volve the negative use of the rule. Assume a condition Fig. 5 (See May 15 TELEPHONY) with the exception that obstruction *L'* has been reduced in size. In this case the four telephones that were re-routed by obstruction *L'* in Fig. 5 can now be carried by street *G* to axis *O* and thence to a point below axis *F*. The obstruction *L'*, therefore, does not cause these four telephones to fall on the opposite side of *F* to where they naturally fall when measured by the rectangular method and the rule is not applicable. In other words, obstruction *L'*, in the latter case, will not affect the theoretical telephone center. Having disposed of the methods used in handling obstructions, the remaining condition which frequently presents itself is that of diagonal streets.

Diagonal streets of any considerable length are usually found only in the older cities. These streets are generally used for distribution routes, as they considerably affect the length of the wire mileage from the central office to the telephones lying on, and closely adjacent to such diagonal streets. It is on account of this saving in mileage that they affect the telephone center. As in the case of obstructions, no definite set of rules can be worked out by which to determine the advantages of diagonal streets or their effect upon the theoretical telephone center, but in the same way tentative rules can be worked out which will indicate the advisability of considering them. When considering territory involving diagonal streets, the theoretical location by the rectangular method should first be worked out. When this point has been found, the effect of the diagonal streets should be considered if they conform to the general rule to be given presently. Consider Fig. 6 as representing a territory in which *O'* is the theoretical center, and *U-U* a diagonal street of such an extent as to lie wholly within one of the rectangles formed by the axes *P* and *G*. Roughly, all telephones lying east of street *Q* and north of street *U-U*, as well as those lying on and closely adjacent to *U-U* on the south, may be routed via street *U-U* to *O'* at a saving in mileage over a rectangular measurement. It is also obvious that, with relation to point *X*, street *U-U* affords the shortest possible path for the telephones lying, as stated, along street *U-U*. The question then becomes: will *X* as a telephone center provide a more economical mileage to all telephones within the territory than *O'*? This is terminated by obtaining the number of telephones which would use street *U-U* as a route to *X*, and the average mileage to such telephones. If *O'* is shifted to *X*, the mileage to all telephones lying south of axis *G* will be increased by the perpendicular distance from *X* to axis *G*. The telephones lying in the territory between *E* and *G* need not be considered, as the perpendicular distance to either *E* or *G* will be the same. Thus if *O'* is shifted to *X*, the distance from all telephones between *E* and *G* will be measured north to *X*, while in the present plan, with *O'* as a center, the measurement covers the same distance, but south in place of north. The number of telephones south of *G* being ascertained when locating *O'*, the added mileage can be applied to them if *O'* is shifted to *X*, and the average mileage obtained for all subscribers with *X* as a center. It is desired to obtain the lowest annual charges, when considering a change in location of the telephone center, so the best location can be obtained by assuming the point that will give the minimum mileage to all telephones within the territory. It may be possible to differentiate the quantities, and determine a point between *O'* and *X* that will give the minimum.

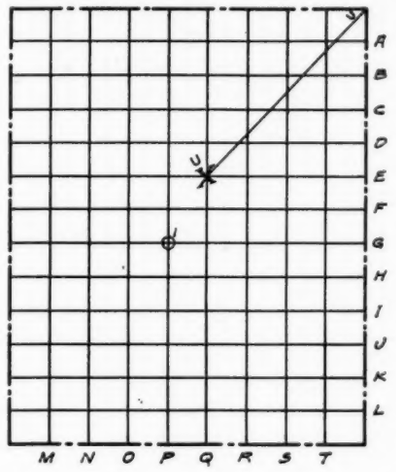


Fig. 6. Telephone Center Affected by Presence of a Short Diagonal Street.

mileage. But, generally, it may be stated that the number of telephones using such a diagonal street as *U-U*, lying wholly in one of the rectangles, is not of sufficient magnitude to affect the theoretical location of the telephone center, and it is upon such assumption as a basis that the rule is made.

When a diagonal street is present, lying wholly within one of the rectangles formed by the two axes located by the rectangular method, it need not be considered as affecting the telephone center.

The second case to be considered, involving the presence of diagonal streets, is one in which the diagonal street intersects the axis formed in locating the theoretical telephone center, and which extends through two or more of the rectangles formed by the axis so obtained. Fig. 7 shows such a condition, in which *O'* is the theoretical center, and *U-U* the diagonal street intersecting the axis *P*, at *X*, and the axis G at *X'*. In determining the influence of such a diagonal street, the same line of reasoning as was used in determining the influence of obstructions is relied upon. It is evident without further explanation that all telephones lying along and closely adjacent to *U-U* will use *U-U* as a route to axis *P* and thence route to *O'*, with the exception of those lying west of *X* to the limits of the territory. For the purpose in hand all telephones lying along *U-U* are assumed to be concentrated at *X* in the same manner as those which were re-routed and concentrated at a point above the theoretical center in the example involving obstructions.

When the number of telephones thus concentrated is obtained, by a count from the map, a new balance is worked out and the tentative center on axis *P* noted. In the same manner all lines are assumed to be concentrated at *X'* and a new balance worked out on this basis. When these two points have been located, the influence of the diagonal street will be apparent, and a final location can be made, if the effect is appreciable, by differentiating between the two locations in proportion to the number of lines affected

*Continued from issue of May 15, 1909.

by *U-U* as a route in each case. When this final center has been obtained, the average mileage per telephone should be measured and compared with the average, using the theoretical location as a center. This will serve as a check on the results, and indicate any change necessary if an error in final location has been made.

All of the foregoing methods to be pursued in locating

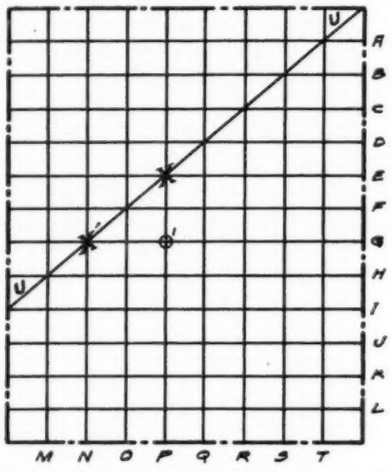


Fig. 7. Telephone Center Affected by Presence of a Long Diagonal Street.

the telephone center, or central office, have been based upon the conditions prevalent in a town requiring but a single office, initially and ultimately, and upon the initial telephones in such a territory. In the writer's preceding discussion of the development study two conditions were considered, the initial territory and telephones, and the ultimate territory and telephones. It would seem then, that a tentative location for the ultimate telephone center or central office location would be necessary, in order to make sure that the present location will serve as a distributing center at the ultimate, as well as the present time, inasmuch as but one office is to be required ultimately.

As a matter of fact, it very seldom proves that the initial location or center will be an economical one for the ultimate. It has been shown in the outline of the development study that there is great likelihood of the territory growing more on one side then on the other, which, in itself, would throw the initial center off for the ultimate territory. In addition to the non-uniformity of growth in various directions, it is a fact that the density at the ultimate period is much different from that for the initial time. These factors make it necessary to locate the ultimate center. The plan upon which the final location is based is the striking of a balance between the present and ultimate centers, thus locating a point which will serve the present and ultimate territory most economically, on the basis of annual charges over the entire period.

(To be continued.)

The "Go-and-Get-It" Man.

It was a cold winter evening, and the troubleman was seated by the fire, happy in the consciousness of a day's work well done. The telephone bell rang He answered the call and was informed that an important mountain toll line had been put out of business by the storms, and that it was up to him to make the repairs. It meant an all-night ride on the train, and the last train was due to leave in less than an hour.

"You will have to buy a ticket," said the voice over the telephone. "Have you any money?" "No, but I'll get some," was the confident reply.

The troubleman's account at the bank was reduced to a minimum, but he drew a small check, stopped at his grocer's and had it cashed, rushed to the station, purchased a ticket and caught the train. Next morning he called up district headquarters, asked to have his check protected at the bank, and was out "on the line."

The storm had done its work well. There was break after break to be repaired, and before the day was done the troubleman was out of material.

Did he retrace his steps back to the station and call in for instructions, or ask to have supplies shipped out from the city? Not this troubleman. His resources were not exhausted, even if his cash and supplies were.

This is what he did. Not far from where he was working there was a station on another railroad. He "snow-shoed" over, boarded the train, "stalled" the conductor and rode to our nearest telephone exchange. Here he secured his supplies, boarded the next train back and again "beat" his way. Having finished his job, he returned to the station, boarded the next train and made the trip back to headquarters without a ticket and without the cash to pay for the ride.

Rather an irregular proceeding all the way through, wasn't it? It's quite a serious affair to issue a check upon funds that do not exist, and what self-respecting person would "bum" a ride on a railroad train?

To begin with he might have protested that he had no transportation and no money, and that he couldn't possibly get out on such short notice. And having run out of supplies, he might have returned to the railroad station and waited for material and money to be sent from headquarters. Wouldn't that have been the natural and respectable thing to do.

Well, this troubleman was made of sterner stuff. He was instructed to "go and get the trouble," and he followed instructions. He went and got it. He realized that it was up to him, out there alone in a wilderness of snow. He proved that he was not a "bonehead."

This is not intended to recommend that men be sent out without funds, nor to suggest that our people "beat." their way on railroad trains. Either would be contrary to rule and practice. But we wish to pay tribute to the man who accomplishes his purpose in the face of adverse circumstances; the man who can initiate ways and means for discharging whatever trust that may be imposed in him; to the strong, virile, unconquerable man, who never lets "I dare not" wait upon "I would."

Such a one is our troubleman.

And he "carried the message to Garcia."—*The Transmitter*, published by the Colorado Telephone Company.

A Correction.

Through a printer's error, irregularities were introduced into the article by Mr. S. D. Levings on page 572 of May 15, TELEPHONY. Matter beginning with "Fig. 5," below the illustration in the second column should have read as follows:

Fig. 5 shows the theoretical center located at *O'*, and the streets over which the rectangular measurements are assumed have been extended through the obstruction *L* as shown inside the dash lines. Having worked out a balance, *O'* becomes the theoretical center, and the vertical and horizontal axes fall upon streets *O* and *E* respectively. The balance with *O'* as the theoretical center is:

North of axis F, 18 telephones.
South of axis F, 18 telephones.
East of axis O, 20 telephones.
West of axis O, 18 telephones.

In obtaining this balance, the telephones lying on the axes have been neglected for reasons previously stated. The next step, in the method to be pursued, is to obtain the influence upon this theoretical center that the obstruction *L'* exerts.

Engineering Personality and Organization*

By Walter C. Kerr

President Westinghouse, Church, Kerr & Company.

I have a few words to say to you about engineering individuality and organization; about the breadth of the man and of organizations; about team work; also regarding the conditions through which each man reaches his fullest capacity for the performance of his best effort; and the suggestion that you keep your eyes so wide open, and your perception so clear, that you can sense in advance the training requisite for the final attainment.

No definition of individuality, nor yet of organization, seems necessary. They possess points of similarity and of difference. The individual, whatever be his traits, is always a part of a complex organization—in fact many organizations. He is a part of human kind, of society, of a group of more or less like kind as in a profession; he is part of the organization of a nation, of a state, and probably of a municipality. At no turn can he get away from his part and companionship in organizations of many kinds. He has duties to render to all. But it is not thus broadly I refer to organizations in this brief discourse. I am limiting the consideration to individualism in engineering and organization work as carried on by groups of engineers. Individualism has to do with the performance of a man himself. Organization has largely to do with what he shall perform, and what shall be the result of his performance, especially as related to cognate branches and other human effort.

An engineer should be an idealist from youth to maturity. He must aspire to high position among men. He must, through his developed capacity, grasp and control the inter-relationship of everything concerning an undertaking from conception to use. This grasp embraces the adaptation of all the varied branches of engineering to produce the ultimate results required in complex projects, and a special or expert knowledge of the predominating requirements. It should also cover a broad conception of finance, the accepted methods of procuring and accounting for funds, and a clear idea of the operation of properties after their installation.

With such an ideal clearly in mind, its attainment necessitates the appreciation that it cannot be achieved in a day, nor without long and varied practical experience. It must be sought with energy and discretion, and with earnest cultivation of breadth of view, character, integrity, healthful living, and useful recreation.

It is not given to all to realize their complete ideals, but as far as you are able to go you should make the results good.

No time can be more important or interesting to a young man than that in which he begins to apply himself usefully to his work, as he sees it. He will consciously or unconsciously shape himself to some general line of action, which will result in his becoming a certain kind of man or type of engineer, regardless of the particular operations to which his talent is applied.

We all see things somewhat differently. We are all, more or less, creatures of present influences and previous conditions. The previous condition of any man, with reference to any thing, largely shapes his view, opinion, and action concerning it.

When the man reared on the mountain and the inhabitant of the valley view the plain, their impressions are quite dissimilar. Between the man accustomed to frontier hardship and one accustomed only to the luxurious ease of metropolitan centers, there will arise divergent views concerning the common plane of average surroundings. Thus labor and capital are liable to be arrayed against each other, though their interests are really common. Many differences in the world arise mainly through divergence in view, following upon difference in previous condition

It thus becomes easy to appreciate how men of about the same ability and influence differ in expression and action. What is often called reconciliation of views or opinions is, therefore, largely the bringing about of a similarity of mental attitude toward them. Tenacity of opinion is often only tenacity of position. Men seldom change their opinions so long as their viewpoint remains constant, but the broader the man the wider his angle of vision. The all-around judicial type lives on a mental plain in which he can circumscribe any problem, see it from many sides, and from his different views select the most important.

Every young man should realize that all of the manifold organizations of which he will in one form or another become a part, are ever changing. We admit that principles never change, but it is sometimes very difficult to detect whether a so-called principle is a natural and inviolable one or merely an artificial product.

If there is any one thing more than another which I would say has any profound bearing upon the ability of a capable young engineer to succeed broadly in his profession, it is the correct appreciation of the relation between what he can render through his talent and that rendered by engineers of dissimilar kinds through the exercise of their talents. This underlies the relation of individual effort in team work.

Narrowness is largely singleness. Breadth is multiplicity, hence versatility. Narrowness and personal conceit are companions. Breadth and versatility lead to modesty, yet often and usually coupled with that self-confidence which makes a man a strong advocate of that which he believes.

The time was when all of the profound engineering of the world was static. The only engineer, whether called military or civilian, therefore, was the static engineer. Dynamical engineering was in its infancy, and a trade rather than a profession. The broadening field remained within the prerogative of the civil engineer, who therefore was pre-eminently the man who practiced the profession so aptly termed "the art of directing the great sources of power in Nature for the use and convenience of Man."

An expanding world with its ramifying developments caused differentiation, which led to specialization, and there became many kinds of engineers, who, in the aggregate, possessed the talents which the typical engineer should possess.

The field became too diverse for the individual man to encompass, and this led to the unwieldly, undesirable, and somewhat impractical division of labor and responsibilities which for a generation or two has existed.

The authority, vested in the man, providing he exists,

*Abstract of an address before the graduating class of Rensselaer Polytechnic Institute, June, 1908.

whose breadth and talents cover all the requirements of great diversified and complex engineering undertakings, offers a more practical means of performance than its segregation among the many.

But we must deal with men as they are, and the fact is that the necessities of great undertakings have so far outrun the individual that their performance demands a new type, an organization constructed in such a way as to combine all of the talents and restrict the limitations of the many, which shall exercise the necessary judgment and control.

All engineering operations are carried on through organization. The differences lie only in degree. The engineer with one man to help him is the simplest form. When an engineering corps is organized, the degree is raised. A large corps becomes complex and needs management, and when it grows so large as to be divided into squads containing men of different talent undertaking unlike work, real organization methods have been adopted. When this is further extended and made permanent for doing divers things for many people, instead of forming for an undertaking and disbanding when through, we have the type of permanent organization which may be called the new engineer.

The creation of this new type of engineer is the latest phase of engineering development. It is rather less than a quarter of a century old, and in high effectiveness perhaps not more than a dozen years.

This new type is not merely an aggregation of men, but a real organization; organized slowly, just as men grow; correlated slowly, just as men become educated; made effective by long processes of joint action and joint experience; rounded to a degree scarcely possessed by any individual, through the abrasion by contact of personalities differing sufficiently to shape each other, yet not enough to create friction.

Such an organization acts—under proper management—virtually as one man. Its capacity obviously becomes great. On a given project, the various divisions can be worked up in parallel—it being the mission of some to see that the different kinds of work are constantly correlated, and that when the work has developed to a certain stage there are provided numberless hands and feet to attend to its performance.

This is one phase of the modern engineer which has grown, unconsciously, by force of necessity rather than by specific intent. It has the capacity to create a property from inception to operative finish. It is always ready at a moment's notice to undertake work of any kind and magnitude. It is always available for emergencies. It has grown in response to the demands of complex physical properties, which need to be created as a whole—with equal skill devoted to all their widely differing functions, which are too intimately related to be served by men whose work is not correlated by organization.

Financiers and others who must carry the prime responsibility for the creation of the largest works desire to lean on the fewest individuals, and as the complexity of their work would demand many personalities they naturally seek firmly developed organizations which so combine these personalities that they can lean on the group as on a man.

It is frequently remarked that large work, costing millions of dollars and extending over a period of years, suffers a needless hazard when entrusted to an individual, who might die, or be incapacitated by severe illness, or even possibly become mentally less competent as the work progresses. From these limitations, organization is the safeguard.

Such organizations in general comply with the usual conventions and practice of the respective types of engineers employed. They contain ample demonstration of the strength of unity.

Parallel with the growth of such organizations, there has been another development which might seem contrary to precedent, but which on closer analysis will be found to be rather a return to first principles. It is the performance by such organizations of constructive work, this being performed for a fee in the unselfish spirit of engineering service, and not in the speculative or selfish spirit of contracting.

In the recent past, it became usual for engineering work to be designed by the highest talent, but executed through common and almost unskilled labor. Further development constantly necessitated higher grades of skill in performance, and a closer supervisory conduct of the work by the engineer. This process continued until the time came when much of the performance of the work was of exactly like kind with its design, and in order to get it correctly performed the engineer needed to put his hand to the work itself. This began chiefly in dynamic lines, and has extended to others.

I think the time has about arrived to conceive of engineering as beginning with contemplation and passing through design and specification to and through construction and placing in operation, with no change of hands and with no break in the continuity of direct engineering control of the work itself.

This view one often hears unconsciously voiced by an engineer who, after all kinds of trouble and excess costs through contractors, says: "Give me the workmen with a few foremen and superintendents and I will do the work myself and do it right, on time, and within the estimates."

One of the Stevensons of Edinburgh, a family famous in engineering work for more than a century, said: "The duty of the engineer is two-fold—to design the work, and to see the work done."

There have been too many artificial divisions as to where one type of effort should stop and another begin. A principal one of late generations has been the line between design and construction. This is not a natural division, but a purely artificial one, born perhaps of the practice of meeting the conventional views of a given time. Times change, however, practice varies, and it becomes easy to see what may have appeared like natural divisions are after all only artificial.

A parallel to this lies in what we call the natural order of plants. We are taught in botany to regard these natural orders as divided from each other by natural lines, and we therefore refer to the natural divisions. A moment's reflection, however, will indicate that there is simply a natural sequence from the lowest to the highest, in which man has drawn artificial lines for convenience of classification, and thereby divided from each other certain orders which possess more or less like characteristics. It is the sequence which is natural and not the orders. So in engineering, from inception through to finished construction, there is a natural sequence to performance, rather than natural dividing lines. Keep your eye on integration, rather than differentiation.

The burden is upon every engineer to do his work right, not merely to design it right and let some one else do it wrong. He may utilize any means of assistance, by contractors or otherwise, but if through such assistance he cannot get proper results, he must be able and willing to put his own hand to the work and bear his burden. The frequency with which assistance fails leads many by experience to do their work at first hand, and organizations of engineers largely follow this method in the interest of quality, economy, and time.

The importance of this to the young man is that with each passing generation a considerable change takes place in all modes of procedure, and it is not to his advantage to find that methods have changed while he is asleep. He should be alert to see what changes are coming and judiciously meet those which are real.

I use this development of the engineering organization as illustrative of a change that has come, and it is indicative of others. Among these may be briefly mentioned the fact that the individual engineer, as he becomes broader, is becoming more of a factor in affairs. His advice is sought in things other than engineering, yet more or less related. He is constantly growing more into the counsels of men of other vocations, and will stay there just in proportion to the degree in which he is helpful.

A corroborating feature in the quality of this development is the cycle through which it returns to the simplicity of first conditions. Early architects designed and constructed. Early engineers designed and constructed. Both grew with the advancing arts. Differentiation occurred. Professionalism arose. The professional man ceased to construct. Further advance caused professional specialization. Creative forces scattered from the man to the many. Organization has brought together these personalities and, through well-ordered means, returned in effect to the individual. The individual, then, through this effective organization, constructs, and we are back again to the early days in which the architect and the engineer both designed and constructed.

It was Emerson who called attention to the difficulty of stating one truth without violating some other. It is thus difficult to discuss the qualities of organization without giving rise to some misapprehension.

I especially do not wish to imply that organization displaces or absorbs personality. Let no man fear that in entering an organization he is sacrificing his individuality. Individuality is not limited by organization, but the means of individual expression become changed. A man cannot be a bad man and a good engineer. He may think he can, but he cannot. A man will find his level, be it high or low, more quickly in organization than elsewhere. His qualities and limitations become better and more quickly measured.

The necessity for the development of engineering organization does not mean that the day of the single-handed engineer is over, though it must be admitted that the years as they pass are constantly surrounding him with additional limitations. There are men who are better fitted for individual effort than for what is generally called organization work. There is also a great field for their effort. It is fortunate that all men are not alike, and that all work has not the same characteristics and requirements. With the immense growth of material things, there has become such a diversity of operations that there is room for every type of man, every kind of temperament, and every form of good organization.

Each man needs to perceive where he fits best and to follow that in which his experience, and perhaps his opportunity, indicates the greatest hope of achievement, but nothing can be worse than for a man to fail to realize that there are many paths, some similar, others widely unlike; that there is room for all; that all work to a common end; that some ways are better than others for achieving certain types of excellence; and that the inferior result in mediocrity or failure. Many a man has made a signal success of his life working single-handed. Others who would have thus failed have done creditably well in organizations where their best talent could be conserved, their weakness supplemented, and their limitations safeguarded.

The high specialization necessary for great profundity in any one branch of engineering tends to limit the capacity of the individual in the practical conduct of work, but not so when he exercises his effort through an engineering organization. For this reason, I believe the ablest engineers, to accomplish their ambitions most surely within the comparatively few years allotted to a man to work at his best, will prefer to identify themselves with organizations which carry, without their individual effort, the major burdens of physical operations, so that their portion of profoundly skilled service can be rendered into the largest volume of work.

There is much difference between things and the names of things. Thus organization is to many a name, but if any one will spend a quarter of a century developing an organization he will find that the name can be forgotten, except for convenient use, and his thought will turn to what it means to perfect an organization and make it effective. It is not sufficient merely to bring talented men together. Men who are individually effective are often ineffective when grouped. Talent alone is not sufficient, but temperament and personality are factors of the utmost importance in the necessary correlation of team work.

A man studying one branch of engineering can acquire much knowledge of other branches through contact. This contact requires the presence of men and facilities, a broader world, in which a man principally acquires that for which he strives, but also much that is useful which rubs off against him.

Some men have apparently great discernment for seeing about half way through things. In nothing more than in engineering is it necessary to see all the way through. This capacity is not altogether a matter of age and experience. It is born in some and cultivated in others.

Ability to cerebrate has not materially increased in the past two thousand years, but ability to get facts has. This marks the difference between logic founded on the intellect and that based on laws, facts, and real knowledge. The engineer starts from the latter, and if he will safeguard his facts his logic will not go far wrong. In one sense it may be said that a man's horizon extends as far as he can see, while his radius extends only as far as he can act. You need to broaden the one and lengthen the other.

Every young man should realize that the way about which he has been thinking may be outclassed by a way that has not occurred to him, and should keep an open, wholesome, and receptive mind regarding all relationships in the world and all methods of performance, with a discerning eye to the advancement of method as the world passes from decade to decade, and to read the handwriting on the wall just a little before it is written.

Last Year Shows Record Growth of People's Telephone Company, of Quebec.

The 20th annual general meeting of the People's Telephone Company was held at the company's head office, Sherbrooke, Que., on May 17. A large number of stockholders were present. The annual statement was read and showed a net gain in new business far in extent of any previous year of the company's history.

The following were elected directors: Col. E. S. Bernard, C. H. Kathan, Wm. Farwell, Dr. H. A. Meagher, B. Quinn, J. A. Begin, C. A. Young, C. H. Fletcher, C. A. Jenkins, J. A. Gauthier, C. Skinner.

At the directors' meeting the following officers were elected: President, C. H. Fletcher; vice-president, Dr. H. A. Meagher; general manager, C. Skinner; assistant manager, secretary and treasurer, C. J. Wright; auditor, E. Hargrave.

The board of management is composed of Messrs. C. H. Fletcher, C. Skinner and Wm. Farwell.

The company is reported to have expended $5,900 as an addition to plant account, showing a net gain of new business far in excess of any previous year.

How to Reduce Depreciation

In his paper on this subject presented at the Missouri Convention, Mr. H. C. Todd, of Maryville, said:

"As I see it, the engineer is the first one to prevent and reduce depreciation by his careful laying out of the plant in such a way that all material can be placed in its proper place, and not be moved and damaged in correcting an error; also, by specifying such material, switchboard and instruments as will last the greatest length of time at a reasonable cost, and at the same time give the proper service required, for only such class of material will make the largest returns on capital invested.

"During the installation of the plant, we cannot use too much pains in overseeing the manner in which the material and apparatus are placed together and installed, for I have seen some A No. 1 material put together in such a way as to cause it to depreciate much faster than if installed correctly.

"To give you some examples of how depreciation can be reduced, we will take the simple work of hanging a telephone for the subscriber; never put it in the kitchen, over or near a radiator or hot air registers, or close to a stove, if you can possibly help it, for in such places the best of apparatus will depreciate very much more rapidly than elsewhere, because the steam and grease in a kitchen are very hard on a telephone, and the heat from the heating appliances will take the glue out of the cabinet, and the lumber used in cabinets will shrink up and leave cracks which will soon make it an undesirable telephone to keep in service. Nor should you place a telephone on a wall where it is likely to be run into by passers-by or damaged by furniture, etc., being carried past it, for you run the risk of getting the transmitter arm, transmitter or writing desk broken, which surely depreciates a telephone. These, with numerous other little items cannot be watched too closely by the installer. Depreciation can also be checked by always going over a telephone and putting it in first class condition before leaving the shop. You will be surprised to see how many little repairs can be made that will protect the instrument from going to pieces.

"In the switchboard room, there are many ways in which you can reduce depreciation. First, by having a set of rules governing the operators, and by enforcing them, you will be able to keep the switchboard cabinet and apparatus in a condition almost like new and it will last a much longer period of time; I know of at least one switchboard, handling about 2,500 calls in 24 hours, that is equipped with a new set of cords only once in 5 to 6 years, these results being obtained by the proper trimming of the cords and keeping the outside braid wrapped to withstand abrasion. The switchboard cabinet should be cleaned thoroughly, and polished with an efficient wood polish every two or three months, in addition to the regular cleaning or dusting given it every morning. In using this polish do not apply to a surface of more than one or two square feet at a time, and rub down thoroughly before applying more. This polish can be made by using 1 qt. of boiled linseed oil, 1 pt. coal oil, 1 pt. Japan dryer, 4 oz. pulverized resin, 1 pt. apple vinegar. In preparing this polish, be sure that the resin is well cut and thoroughly mixed with the solution. This polish leaves a dry, hard, polished surface.

"Good approved protection against lightning and stray currents will also cut down depreciation of switchboard coils and telephone coils, sometimes even the cabinet. Turning to outside construction, it should be impressed on all employees that they should do every piece of work so that it will last at least ten years, and as much longer as possible, at an economical expenditure of time and material, and to always do a piece of work permanently. Often you never get around to complete the temporary work, and many times, the temporary work will not stand until the time you expect to do it permanently; in fact, never do any more temporary work than absolutely necessary, as it often depreciates material.

"By building your plant with at least from 60 to 75 per cent cable, using double wrapped dry paper insulation, adopting an underground system in at least the fire district, and on some of its heaviest residence leads that are upon improved streets, also the block or ring wiring system upon the well built up business blocks, avoiding all long spans of duplex drops in the entire system, you will greatly cut down the per cent of depreciation.

"In outside construction, use nothing but galvanized hardware, even to pole steps and lag bolts, and it will pay to see that you get a good grade of galvanizing.

"All poles should be shaved and treated with the best obtainable preserving compound from the butt end up to 18 inches above ground line. The cap or roof, and gains should also be treated with this preserving compound. Dip the butts in a dripping tank arranged for that purpose if you are doing enough of this kind of work to justify the expense. The treatment will give better results if the wood is well seasoned.

"All cross-arms should be ordered of the best obtainable wood of the kind that will last the longest in your locality (we use Washington fir), the arms to be 3¾ x 4¼ in., unpainted, bored for ½-in. Western Union steel pins, ⅝-in. body bolt and ⅜-in. brace bolt, arms to be straight grained, taken from the heart of the tree, rejecting all sap wood and wood that is filled with pitch seams; better pay a little more and get every arm good, for the cost of labor replacing the poor ones in a short time is more expensive than the cost of a good arm. Then proceed to boil these arms in the same compound used on the poles, at least thirty minutes, then immediately dip in a vat of the same preparation which has not been heated. This process will preserve poles and cross arms, making their life from 50 to 100 per cent longer.

"Not a piece of wood should go into the ground permanently that is not treated in this way, even the slugs used on guys should be bored for the rod prior to the dipping, so that the point where the most strain and where rotting would most rapidly occur, will be preserved. I recommend the arms described above for the reason that the wood pin arms always break at a pin or at the body bolt. You very seldom see one break elsewhere. Then doesn't it stand to reason that a ½-in. hole bored in the arm will leave more strength than a 1¼-in. or 1½-in. hole? Did you ever see an iron pin broken? The Western Union Telegraph Company uses these pins over and over again. Then another advantage, you can draw them down tight against the arms on top by the taps beneath the arm, and after driving a six penny nail in the arm from below to keep the tap from turning loose they will exclude all moisture from the pin hole much better than the wood pin.

"A 6 pin arm 3¼ x 4¼-in., of Washington fir, equipped in this manner, will cost approximately only 25 cents more than the same arm untreated, with wood pins, and you can use the pins forever with only a slight expense for repairs, that being a few new cobs for the top, for in the work of changing iron pins to new arms, occasionally a wood cob will be broken.

"Poles and arms treated in this manner will complete seasoning without causing dry rot and still will not take moisture from without, and the preserver being a disinfectant, you will not find worms and insects eating into the

wood which is the prime cause of rot below the ground line. Then immediately at the ground line and for a few inches above and below, another enemy assists in rotting the pole, this being a continual taking in of moisture and then drying out, which is almost entirely prevented by the use of this preservative compound, as it will not admit a very large percentage of moisture.

"In localities where ants eat cross-arms in two, this will put the insect out of business; in localities where woodpeckers are exceptionally bothersome by cutting poles and cross-arms all to pieces, the use of this preservative all over the pole and arm, from top to bottom, will stop this depreciation; never paint a pole or cross-arm with ordinary paint, if you can possibly avoid it, as this will cause dry rot, which depreciates poles and cross-arms rapidly. Of course, in cities it is sometimes compulsory on account of ordinances

"All poles over 25 feet long, and even sometimes this short length, should be stepped with galvanized iron steps. Where poles are exposed to daily abrasion, by wagon hubs, etc., or where used as hitching posts, they should be protected with galvanized iron protection strips and plain iron hub plates.

"When building a corner or dead end, on a lead of any size, use poles of large size, butts and tops. Pick the very best, then don't forget that poles have almost the same tendency to push down in the ground (when properly guyed) as to pull over at the top. To prevent this, fill the bottom of the hole with 3 or 4 inches of concrete, or use a heavy piece of lumber treated in preservative compound, which will keep the poles from pushing down. Where guys enter the ground on heavy leads, place an old boiler tube over the guy and rod to protect them from abrasion, such as being hubbed by wagons, etc. Cross-arms at these points should be braced on the back side with galvanized angle iron braces, to keep them from bending rainbow style or twisting out of place.

"On toll line work, storm guys will assist wonderfully in cutting down depreciation.

"There is at least one type of porcelain insulator made today that will stand more buckshot, rock and other abuse than glass, and will undoubtedly cut down depreciation on insulators. You can pour a bucket full of them into an empty barrel and scarcely break an insulator."

Advantages of Toll Line Development by Local Companies.

Although Mr. A. F. Adams of Joplin was unable to attend the Missouri Convention, his paper on the above subject attracted favorable attention. Following is an abstract:

"First: The development of toll lines between the exchanges owned by the same company.

"Second: The developing of the territory and the connecting of the exchanges owned by different companies, but in the same district or community.

"Third: The building of long distance lines to connect the local groups or districts composed of Independent Companies having their own local toll lines.

"With the building of our exchanges, we have only half developed the territory. We have educated the people to the use of the telephone. With every new telephone connected up we make each subscriber's telephone that much more valuable to him. But he is not satisfied. He has friends in the neighboring towns with whom he would like to talk and had we the toll line connection he would use it according to his business and social interests. We have taught him the advantages of the telephone and he is going to use it to the fullest extent. We must build toll lines, and good toll lines.

"Good toll line service is one of the most necessary adjuncts to the telephone system. It is a fact that has been demonstrated conclusively that properly built and properly managed toll lines are the best paying part of the system.

"Toll lines connecting the exchange help to hold the subscribers we have. With exchange facilities and toll line facilities there is nothing more for the subscriber to ask for and it leaves the competitor no argument on the grounds of "additional advantages." Toll lines help to get new subscribers. Every business man has, more or less, a diversity of interests and every new point connected by toll line brings new subscribers because we have furnished means of communication with people who could not be reached before.

"In building toll lines we increase the revenues of our exchanges. Along toll line routes we have numbers of farmers wanting exchange connection to various towns in the system. They have not been connected and are 'talking mutual.' Run toll lines through this territory, and as soon as we have the pole line for toll purposes, we are in a position to furnish service, where before this we could not build for this purpose alone and get a fair return on the money invested.

"In competition we have the advantage. We have the good will of the people and so long as the people are treated right they will continue to be loyal. They do not easily forget the conditions that existed before the advent of the Independent companies. We all appreciate the loyalty of the people to the Independent companies, but we must give the people the service they need and not depend on loyalty. We must give toll service to hold the business and if you have not, and are not, giving the service you are offering every inducement for competition to come, and losing profits that you should make out of your toll lines and additional exchange profits you would make if you had toll lines.

"The question here arises, how can we handle this problem to get the best results? There are long distance copper wires running through the country in different directions with which we can connect, but they do not now and never will cover the field in detail. They are the limbs of the tree, and it is the local companies that must furnish the branches. How shall we do this? We can build our own lines between our own exchanges developing this territory fully, and then by mutual agreement with companies in adjacent territory, extend our lines to certain points to meet theirs; each company to look after the maintenance of the lines so far as they have built.

"This plan, when companies were young, and the toll business was in its infancy, worked satisfactorily, but with the increase of business, the constantly extended lines, the trouble in the division of tolls, the routing of messages and the building of new lines, there has come a demand for other and better methods.

"A good working organization is obtained by the local companies organizing toll line companies to manage the toll business between different exchanges and systems. Under this plan there is practically no limit to the size of the organization, it being governed by the conditions existing in the locality where the lines are to be built. It may cover a county or a number of counties. In this organization the different companies interested take stock and elect officers, and run the toll line company the same as its exchange company. The details of arrangement must be worked out according to local conditions.

"Local toll lines are, if built with judgment, always good paying propositions from the start. The revenue begins immediately without much soliciting or advertising. The local companies should own all the toll line in

their community or district, and depend upon the long distance companies to furnish the long distance service between the different districts.

"It has been claimed by the Bell monopoly that the Independent telephone business is not stable and that people must go to the monopoly for their long distance service. This is not true of Missouri. As in many localities, the bulk of the toll service is over Independent lines.

"We have a great deal of territory yet to cover, and as much effort should be given to building up our toll lines, as was formerly given to the building up of the local exchanges. The field is open to all, and the development of toll lines will make closer and more harmonious relations between the Independent companies, increase the profits, unite and solidify the Independent interests, make the local exchanges of greater value to the subscribers and thus help to insure the stability of the Independent telephone business."

From the Subscriber's Viewpoint.

By C. H. Petty.

In his paper on this subject presented at the Missouri Convention, Mr. Petty said:

"It seems altogether impossible for some of the patrons of the various companies to form the least conception of the actual working or operation of a telephone.

"It would seem almost a blessing if the impatient subscriber's trouble could end with the difficulties he manages to extract out of his instrument, but he still has the operator to deal with and his attitude toward her is hard to explain unless he looks upon her as an employed agent of the company, hired to cross his ideas as well as his temper, and maliciously insist on doing things wrong.

"The troubleman comes in for his share of the berating on the part of the dissatisfied subscriber, because he fails to clean his feet on the door mat, comes in, thumps on the transmitter three times with a screwdriver, says "Hullo" a couple of times and pronounces it "O.K.," and when going out steals all the fruit off the dining room table and then leaves the gate open. Consequently he bottles his wrath, and whenever he feels unlucky he proceeds to unload it upon the poor unsuspecting manager, who stands and takes it just as if he liked it, and as soon as the gentleman has worked the most of it out of his system and cooled off a little, it is the manager's cue to proceed to wreath his countenance with a genial smile, apologize in due form and then commence on his enviable duty, that of explaining all these things to the poor victimized subscriber and making a friend out of him before he gets without the boundaries of the telephone office. Then maybe he has got him in shape and maybe not for he is likely to not even want to believe the ever truthful manager.

"But there is another phase, another type of humanity to deal with that gives us the real pleasure we find in serving the mass of people who depend on us to help carry on the immense volume of business that is necessary to turn the wheels of progress, and that is the reasonable or broadminded subscriber who knows that a telephone is not a thing of life to harass him when he is in a hurry and impatient, but a piece of mechanism delicately constructed, yet necessarily so, and this telephone belongs to a body of men who have devoted their lives to its upbuilding and know that it is to their interest to keep it working properly at all times.

"Suscribers have their whims and are a great study. The successful merchant knows how to approach his customers and how to deal with them, so does the successful telephone operator know her patrons, or should at least, for she has all classes, the fretful and impatient, the jovial and good natured and the man who is at the point and strictly business at all times; but there is one rule or one motto which the operator can use to handle them all with, and applies more so to the larger exchange, and that is to be forbearing and pleasant yet strictly businesslike at all times, then she will please nine out of ten no matter what their dispositions may be."

Telephone Evangelism.

According to the Cincinnati *Star,* telephone evangelism is the very latest. It was tried in Cincinnati recently and as far as is known was the first systematic use of the telephone as an adjunct to a revival campaign for souls. The telephones of members of Christie M. E. church who have not been seen at the revival services being carried on at their church rang for them as church bells.

"Hello," says the church member whose interest has not been as keen as it might be in the revival.

"Hello," says a sweet-toned woman's voice at the other end of the line, "this is Mrs. A. Well, I just called up to remind you about the revival services. They are just fine. I never heard the pastor doing better preaching in my life. I noticed you were not at church last night and I hated to have you miss the good times. We're having the finest singing and the greatest outpouring of the soul and you don't want to be absent. We not only want you to come for the good it will do you but for the good it will do us. Will you be at church tonight? And would you mind calling up three of your friends who don't go to any church and telling them what fine programmes we are having and give them a cordial invitation to come and to call up some of their friends and invite them?"

By this time the church member who has not been coming gets interested, possibly enthusiastic. Indeed, that church member will call up friends and will come. The "telephone" evangelism as an adjunct to his revival services was planned by the Rev. L. O. Hartman. Christie M. E. church has been experiencing, during the past three weeks, one of the most successful revivals in its history.

The telephone feature is in the hands of a special committee. Every morning, with her young women assistants, the chairman of the committee is busy with the telephone. She has a list of the non-coming church members and calls up each one of them. The first day that the plan was tried showed great results.

An Old One, but Worth Printing Again.

A garrulous old lady might get hung on the line and keep it employed for an hour talking about the children with the measles and the chicken with the pip. During all of which time another neighbor, who desired to send in an urgent call for the doctor, must stand and wait. This caused confusion and discontent among the subscribers, because there are times when a man needs the telephone and needs it quick, says Harris Dickson in "Ringing Up Rural America," in Hampton's Broadway Magazine for November. For instance, Milly Hawkins, the red headed daughter of the dairyman, had been talking for half an hour, when the voice of a Dutch farmer broke in:

"Hello, central; I van——"

"Aw, cut it out," said Milly. "I'm using this line."

"But——" protested Hans.

"No but about it," said Milly. "I'm talking; you shut up."

"I vant to speak to——" insisted Hans.

"No matter who you want to speak to; keep off. I want you to understand I'm a lady."

"But I vill reimburse you, madame," said Hans.

"I don't want to be reimbursed; I want to talk."

"But I must talk"—his voice came in one long yell over the wire—"mine house is on fire."

Letters on Practical Subjects

Troubles on a Mutual Line.

We had a ground on our division of a mutual telephone system, so that we could hardly ring any one. One subscriber could not be called nor make a call, so took his telephone down and carried it to the man who installed it. He examined it, and, finding nothing wrong, they put it up again, but it did no better. On looking for the trouble on the subscriber's premises, and examining the wire on the porch, they found that the line and ground wires had been crossed in installing the telephone. One wire had been run through the neck of a bottle which had slipped along and let the wires make contact. The man who put it in claims that by putting the line and ground wire close together in this way he makes a condenser.

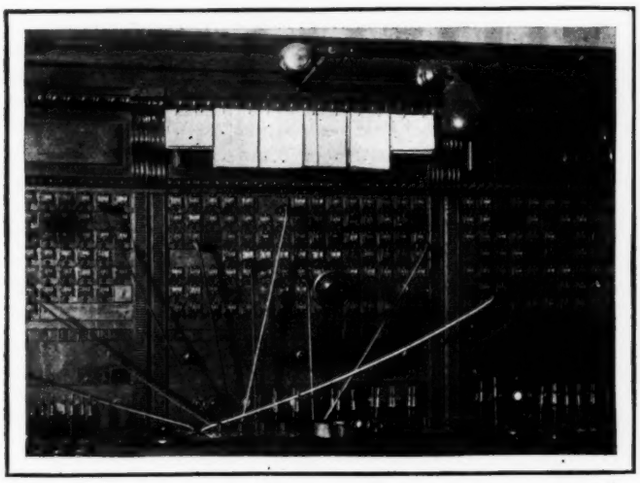
Another time I called up a party and got an answer, but could hear only a word or two. When the party rang one long ring it would be broken up at my end into short rings and we could not talk, so I went to see what was the trouble. I took the telephone down and found the wiring all right, but found the two upper hook contact springs touching and the spring under the hook did not make connection. By bending the spring under the receiver hook down a little, the trouble was corrected.

Here is another case: A party called, but could not understand or be understood. The trouble was a poor connection. Some one had told the people to cut the line, so that they could unhook it when a storm came on. They cut the line, and made a hook in each end, and just hooked the wires together when the storm was over. When the wind blew the words and rings would cut out.

Dry Forks, W. Va. E. C. Mersing.

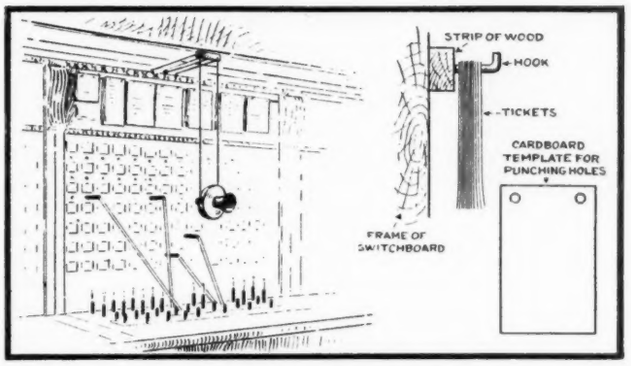
Provision for Toll Tickets in Small Exchange.

The accompanying photograph shows our switchboard as it appears equipped with a handy arrangement for keeping toll tickets in an orderly position. Some such a plan is necessary, as we handle both toll and local business from the same switchboard section, and it is not equipped with proper



A handy Arrangement for Keeping Toll Tickets When the Switchboard Is Not Equipped with Pigeon Holes.

pigeon holes, such as are installed in the standard boards designed for toll services exclusively. The drawing shows just how the arrangement for suspending tickets is applied to the switchboard. In preparing the tickets for the board, two holes are punched near the upper ends. A cardboard guide is used so that the holes may be the proper distances apart and from the edge, corresponding with the hooks. They are then suspended from the hooks, which are screwed into a strip of wood having a one-inch cross-section, fastened to the switchboard as shown in the drawing. This keeps them



Details of Arrangement for Suspending Toll Tickets From the Switchboard.

out of the way, and in a compact space, yet easily accessible to the operator.

Sabina, Ohio. Fred Ludlum.

Mice Caught in Keyboard—Where Do the Operators Eat Their Lunch?

A very peculiar case of switchboard trouble attracted my attention a few days ago, and I deemed it worthy of mention. One of the operators claimed that she received a shock every time she answered a call. On investigation I discovered that on touching a plug with one hand, and the frame of one of the keys with the other, current passed through the body. As I had noticed some key trouble on that position the night previous, I naturally surmised that I had grounded one of the keys in replacing it.

I immediately removed every key (without disturbing the wiring) then carefully replaced them so that I was confident they were not grounded on the frame. I then began a test on the wiring of the keys, and, after going over several of them, discovered a very small mouse securely lodged between the wiring of two keys, allowing current to pass from one key to the other through the little animal's body. Master Mouse was extracted with a pair of long nose pliers, and my trouble was cleared. Only a week after this the same operator complained of her board being noisy, and a mouse caught in this manner proved to be again the cause of the trouble. Keyboards are very excellent and effective mousetraps, but, needless to say, I have invested in a more practical design, generously supplied with cheese.

Leavenworth, Kans. Harry Miller.
Wire chief, People's Home Telephone Co.

Objection to Use of Soda on Soldered Joints.

In TELEPHONY, May 15th, page 575, under the head of "How to Do Soldering," M. C. Wilson tells of rubbing soda on the joints after they were soldered, to get rid of the corrosive effect of the muriatic (hydrochloric) acid. I would suggest that the parts be washed with clean water to remove the chloride of sodium (common salt) which results from the union of the acid and soda, which has a tendency to corrode iron surfaces.

Manchester, N. H. A. A. Jenkins.

The Telephone in the Courts

Conducted by A. H. McMillan

Physical Connection of Independent Lines.

A stockholder or subscriber in the Wythe Mutual Telephone Company of Wythe county, Va., sought a writ of mandamus to compel the Virginia and Tennessee Telephone Company to connect its lines and exchange service with the Wythe Mutual Telephone Company upon the same terms and conditions as it at that time connected with the Wytheville Telephone Company.

A number of interesting questions were raised in that case which it is regretted the court did not pass upon. One was that, if there was any jurisdiction to grant the relief asked, it was vested in the state corporation commission, and not in the Circuit Court; also that the law did not require physical or business connections between Independent telephone companies, and if it did, that such requirement would involve the taking of private property, which can only be done by the exercise of eminent domain.

The court denied the petition for mandamus and decided the case upon the ground that a patron of a Mutual telephone company can demand of it only the same service that it renders to other patrons of the same class, and can only require of another company the use of its system on the same terms accorded to the public generally. Hence, mandamus, said the court, would not lie on his behalf to compel the latter company to connect its lines and exchange service with the subscriber's company on the same terms and conditions as it connected with a third company; these being matters of business policy to be determined by the companies themselves, subject only to the visitorial authority of the state. Another ground relied on by the court was that the Wythe Mutual Telephone Company was not a party to the proceedings and that the plaintiff possessed no authority to dictate to that company. Ivanhoe Furnace Company vs. Virginia & Tennessee Telephone Company, 63 N. E., 426.

Verdict Exonerating Agent Exonerates Principal.

The plaintiff sued for damages for injuries, which he received while working for the defendants in the construction of a telephone line, by reason of the breaking of one of the poles through defects which rendered it unsuitable for the use for which it was intended. One of the defendants, a man named Rosenthal, admitted employing the plaintiff, but declared that in so doing he was acting as the agent of the other defendant, the telephone company. On behalf of the telephone company it was sought to be shown that Rosenthal was building the telephone line upon his own responsibility and not as agent of the telephone company; that his method was to construct such lines in the rural districts at his own risk and cost, and when constructed seek and obtain telephonic connection with the lines of the telephone company. Rosenthal, on the other hand, contended and introduced evidence to show, that he was building the line for the telephone company and in managing the work of construction he was acting as its agent. As to the accident, it was not disputed that it resulted from the breaking of a telephone pole, the selection of which was not made, nor directly authorized to be made, by the telephone company, and that the selection was made by the defendant, Rosenthal. On the trial, Rosenthal was absolved from liability and the company was held. But on an appeal taken by the company the judgment against the company was reversed. It was held that the employe's responsibility is primary and the employer's responsibility secondary in the sense that he has committed no moral wrong, but under the law is held accountable for his agent's conduct. While both may be sued in a single action, a verdict exonerating the agent must necessarily exonerate the principal, since the verdict exonerating the agent is a declaration that he has committed no wrong, and the principal cannot be responsible for the agent if the agent has committed no wrong. Bradley vs. Rosenthal, Supreme Court of California, 97 Pac., 975.

A Speculative Case Dismissed.

The Lanham Lumber Company brought suit against the Lebanon, Louisville & Lexington Telephone Company for damages in connection with a fire that started in the boiler house of the Lumber Company. The latter alleged that its watchman, on discovering the fire, endeavored to obtain telephone connection with the fire department, but that through the negligence of the telephone operator, no connection was established until the fire had spread to the other buildings so that the efforts of the department, after arriving, were fruitless, and the plant was wholly destroyed. It was also alleged that if connection had been promptly established, the fire alarm would have been given and the company would have reached the scene at least thirty minutes sooner than it did, and would have saved a large loss to the company. The court held that the facts stated were too remote and speculative to authorize a recovery and dismissed the suit. Lebanon, Louisville & Lexington Telephone Company vs. Lanham Lumber Company, 115 S. W., 824.

Unforeseen Accident.

While it is negligence on the part of a telephone company to allow its wires to remain strung on the poles of a railroad company parallel with and about fifteen feet from the railroad trolley wires, after the public use of the telephone wires has been discontinued, yet an injury resulting from the breaking of a telephone wire during a violent storm, its blowing across the trolley wire and becoming highly charged, is not an injury that could reasonably be foreseen. Such was the holding of the Supreme Court of Missouri in a recent case. The action was brought against the telephone company and the street railway company for the death of a child caused by the breaking during a violent storm of a telephone wire, which blew across a trolley wire and hung down near the ground. The next day after the storm, the plaintiffs sent their five-year-old child on an errand which led him along the street where the wire hung down, and a few minutes later, the child was found lying dead near the trolley pole, his body in contact with the wire. The evidence was held not to show notice to the telephone company or the railroad company of the dangerous condition of the wire in time to have removed it before the accident. Strack vs. Missouri & Kansas Telephone Company, 116 S. W., 526.

Construction of a South Dakota Franchise.

An ordinance of the City of Huron, South Dakota, provided "The right is hereby granted to * * * * his successor or assigns, to place, construct and maintain, upon and through the streets and alleys" of the city, a telephone line "subject however, to all conditions and stipulations herein set forth." It required the grantee to accept the ordinance in writing, and to construct the line within four months, which he did.

It also provided that the term of the franchise should be for ten years from its passage. The grantee operated the telephone system for six years, and then conveyed it to the Dakota Central Telephone Company, a corporation organized under the state law. The term of ten years expired, and the council then passed a resolution that no franchise should be granted to any company not controlled by local citizens, and that the franchise should not be renewed, but the company should be required to remove its poles and wires from the street. As the city authorities threatened to forcibly remove the telephone line, upon the failure of the company itself to do so, the company brought suit for an injunction to prevent the threatened action, and on final hearing, it was granted by the Circuit Court of the United States.

The laws of the State gave the owners of any telephone line, operated in the State the right of way, over lands and real property belonging to the State, and to use public grounds, streets, alleys and highways in the State, subject to the control of the proper municipal authorities as to where the poles and wires should be placed. The constitution of the State provides that no telephone line shall be constructed within the limits of any village, town or city without the consent of its local authorities.

The court held that the right of the company to maintain and operate its line was not derived from the city but from the State; that by the ordinance and by its acquiescence in the construction of the line, the city had consented to the building of the line as required by its constitution. It was therefore held that the right of the telephone company in the city was not affected by the ten year limitation in the ordinance. The court held that the consent of the city under the South Dakota law was not a franchise, but that the franchise was the right obtained from the State. Dakota Central Telephone Company vs. City of Huron, 165 Federal, 226.

Telephone News

INDEPENDENT TELEPHONE CONVENTIONS

Mississippi, Jackson, June 11, 12; North Dakota, Devils Lake, July 9, 10.

North Dakota Convention to Be Held at Devils Lake July 9 and 10.

The third annual meeting of Independent telephone companies of North Dakota will be held at Devils Lake on July 9 and 10.

Prominent speakers will be present to address the gathering. President Kelly, on behalf of the Commercial Club, and Mayor Whitman, on behalf of the city, will welcome the visitors. The guests of the city will be given a pleasure ride by the automobile club around the lakes, including the military and Fort Totten grounds. A banquet will be served and a general fine time will be extended the telephone visitors. The general sessions of the meeting will be held in either the Chautauqua Auditorium or the Court House, and convenient booths will be supplied for the exhibits of manufacturers and supply houses.

City of Pasadena Throws Out Bell Service.

Last week the City of Pasadena, Cal., received a favorable decision in its suit against the Pacific Telephone and Telegraph Company, and promptly cut the wires, so that the Bell company was completely put out of business in the city.

By a decision of Judge Bordwell, of the Superior Court, the validity of the Pasadena city ordinance requiring telegraph and telephone companies to obtain a franchise to maintain poles and wires, and imposing a semi-annual tax of 75 cents a pole for lines doing an interestate business unless such franchise is secured, is upheld.

The suit was brought by the Sunset Telephone and Telegraph Company and the Pacific Telephone and Telegraph Company, allied corporations, against the city of Pasadena, seeking a permanent injunction to restrain the city from interfering with the maintenance or operation of the telephone system of the plaintiffs, who claimed the ordinance was void as to them.

The case was heard some time ago and taken under advisement.

Pending the outcome a temporary injunction has been in force, requiring the city to desist from the enforcement of the telephone franchise ordinance.

That temporary injunction is ordered dissolved by Judge Bordwell, his opinion finding in favor of the city on every point.

The case will undoubtedly be appealed by the telephone company to the Supreme Court.

Immediately upon receipt of the news of the judgment for Pasadena, Mayor Earley called a special meeting of the City Council, and that body, acting under the advice of the legal department, unanimously ordered the removal of the company's poles and wires from the streets and alleys. Within a short time six cables had been cut.

On the ground that the decision completely vacated the temporary injunction, the action was taken to force the company, by crippling it, to apply for a franchise. Local correspondents state that there will undoubtedly be an appeal of the case to the Supreme Court and a suit for damages against the City of Pasadena.

Telephone Companies Must Obey the Law in Oklahoma.

The Oklahoma State Board of Equalization is having much trouble with about sixty of the smaller telephone companies operating in the State. They have refused to send in their assessments for the year. Final notices were sent out last week by the Board to the companies that have not reported, advising them that the president of the board had been authorized to issue subpoenas for the officers of each company to appear before the Board, if they do not report immediately.

New Long Distance Circuits in Nebraska.

The following new circuits have just been completed by the Lincoln Telephone and Telegraph Company, of Lincoln, Neb.:

One No. 10 copper circuit from Lincoln to York, Neb., which when phantomed with existing circuits, provides two circuits from Lincoln to Seward and two from Lincoln to York, and also gives Lincoln direct circuits to Grand Island and Columbus as before; also one No. 10 copper circuit from Hebron, Neb., to Nelson, Neb. This circuit opens up Nuckolls county to Independent toll lines, the service never having been satisfactory before.

The West Virginia Convention.

Last week the West Virginia Independent telephone men held a rousing convention at Parkersburg. The attendance is said to have been over three hundred. A full report of the meeting will be published in TELEPHONY next week.

S. N. D. North Resigns from Census Department.

Last week it was announced from Washington that Mr. S. N. D. North, the Director of the Census Bureau, had offered

his resignation and that it had been accepted. It is understood that the resignation followed a conflict of opinion between himself and Secretary Nagel of the Department of Commerce and Labor.

Mr. E. D. Durand, who has been assistant commissioner of corporations, has been appointed Director of the Census Bureau.

Many Independent telephone men had formed an unfavorable attitude toward Mr. North because of recent magazine articles relating to an alleged leaning toward certain large corporations in the East, and also an account of newspaper reports at the time of the differences between Mr. North and Mr. Nagel, stating that Mr. North had the backing of Senator Crane of Massachusetts, who, as is well known, has an extensive interest in the Bell telephone company.

Quincy, Ill., "Boosters" Use Independent Long Distance Lines.

During the recent excursion of the "boosters'" of the Quincy, Ill., Retail Merchants' Association, much satisfaction with the Independent long distance service was expressed by the members. Connections were quickly made at nearly all stopping points, to either the lines of the Quincy Home Telephone Company, or the Western Illinois Telephone Company, of Macomb.

Commenting on this service, the Quincy "Herald" of May 26 says:

"It was a novel scheme and it worked to perfection. Big posters, with inscriptions inviting the excursionists to use the telephone free of charge, were hung in each of the cars, and many people took advantage of the opportunity to call up folks at home, and tell of the progress of the train, and other facts about the excursion. Business men also called up members of their firms to discuss important matters that they had forgotten in their hurry to get away early this morning, or to give instructions to employes. Bulletins about the excursion were also telephoned to Quincy, and on ahead to Macomb, the terminus of the excursion.

"W. B. Tompkins, manager of the Home Telephone Company, was on the train and was personally in charge. He was accompanied by his superintendent, A. M. Crichton, and lineman Ellis Rice."

Undesirable Bills Fail to Pass in Wisconsin and Illinois.

Although the Wisconsin Assembly some time ago voted against the Cleary bill, which provided that competitive telephone exchanges should not be built without the consent of the Railroad Commission, a similar measure was introduced in the Senate. It is reported that the influence of the Bell telephone company was traceable in the introduction of this measure. The bill was vigorously contested, but failed by a vote of 15 to 5. Officers of the International Independent Telephone Association assisted the Independent telephone men of Wisconsin in getting their arguments before the legislature.

In Illinois the Assembly killed the Gardner bill, passed by the Senate, providing that telephone companies might purchase other telephone companies. This bill had been kept closely under cover, and officers of the International Association have been highly praised for their prompt action in showing, with the assistance of several men interested in Illinois telephone property, the effcet it would have upon the telephone industry of the State.

Manitoba to Spend $750,000 Extending Telephone System.

It is announced at Winnipeg, Manitoba, that plans have been completed by the telephone commissioners for the season's program of building and extension by which $750,000 will be expended and 5,000 subscribers will be added to the system in Manitoba. Since the government assumed control there is a tremendous demand for new rural lines and farmers' telephones. There have been 2,500 contracts taken for rural telephones since Jan. 1 this year. Of the $750,000, which the estimates include, there will be $250,000 expended in Winnipeg upon a new exchange for the western part of the city, for extension of aerial and underground cables and also the neecssary extensions to be provided for the Main and Fort Rouge exchanges. There will be $250,000 expended on rural lines in the province, and $250,000 on long distance lines and new exchanges throughout the province.

The chief work in new exchanges will be done at Portage la Prairie, where a new exchange building, to contain an exchange of 5,000 lines capacity, will be erected.

New long distance lines are being erected between the following points in the province: Giroux—La Broquerie; Steinbach—St. Pierre; Stonewall—Warren and Atwell; Souris—Pipestone; Varcoe—Moore Park; Shoal Lake—Oakburn; Strathclair—Elphinstone; Headingly—St. Francois Xavier; Hamiota—Miniota—Foxwarren—St. Lazarre; Dominion City—Stuartburn. Long distance circuits are also being erected on existing poles from Portage la Prairie to Eustache, Sydney to Carberry, Kelwood to Gladstone via Neepawa, Virden to Brandon, Hartney to Deloraine, Souris to Wawanesa, Deloraine to Boissevain, Treherne to Cypress River; Cartwright to St. John's, N. Dak., and Winnipeg to Shanawan. Circuits have already been erected this year from Bradwardine to Brandon, Morris to Morden, Killarney to Ninga and Morris to Myrtle.

Telephone Man Honored by Japanese Government.

The Emperor of Japan, upon the joint recommendation of the Ministers of Foreign Affairs and of Communication, has conferred upon Mr. U. N. Bethell, of New York, president of The New York and New Jersey Telephone Company, the Bell Telephone Company of Pennsylvania, and the Central New York Telephone and Telegraph Company, the Imperial Order of the Rising Sun.

This has been done in recognition of services rendered by Mr. Bethell in giving assistance to the representatives of the Japanese government who have been sent to this country within the last few years for the purpose of investigating the telephone system and the management of large industrial enterprises.

At the Japanese Consulate it is said that this is the greatest distinction that can be conferred on a foreigner by the Japanese government.

Independents Must Get State Authorization to Open Boston Streets.

On May 27 the Supreme Court of Massachusetts denied the mandamus asked by the Metropolitan Home Telephone Company to compel the Superintendent of Streets to authorize the laying of conduits. The Board of Aldermen had granted a franchise, but the court ruled that authorization would have to be given by the state.

Movement of Central Union Telephone Company to Purchase and Operate Independent Plants in Indiana.

The incorporation of the Indiana Union Telephone and Telegraph Company capitalized at $100,000, May 29, is understood to be a movement on the part of the Central Union Telephone Company to purchase and take over a portion if not all the Independent telephone companies now operating in Benton, Warren, White, Jasper, Newton, Lake and Porter counties, a contiguou territory lying in the northwest corner of the state. The incorporators of the Indiana Union Telephone Company are C. L. McNaughty, assistant secretary and treasurer, and Frederick A. DePeyster, assistant traffic engineer of the Central Union Telephone Company. Associated with them is David P. Williams, a young attorney who has represented the company in some minor cases litigated.

The object of the corporation, as set out in the articles, is to "maintain and operate telephone lines, exchanges and systems" in the above named counties. They do not declare the object to be to "build and equip" telephone systems, but simply to maintain and operate. It is known that many of the Independent companies operating in the territory comprising the counties named are already connected with the Bell toll lines, but this movement develops the general belief that the local plants will be consolidated under one management to be owned and controlled by the Central Union Telephone Company.

The New Directory of the Portland Home Telephone Company.

The latest directory of the Home Telephone Company of Portland, Ore., shows a substantial increase in its list of subscribers, there being about 9,000 names listed. This large list of subscribers is evidence that the service given by the company is highly satisfactory to the people in Portland and vicinity. Special attention is directed to the long distance facilities of the company, as a map showing the territory covered by the long distance connections is displayed in the front of the directory together with explicit directions as to the method of calling long distance with the automatic telephone. The rates for long distance telephone conversation are given together with a list of the points reached. Throughout the directory is scattered advice as to the ways in which the subscribers may aid in improving the service. A classified business index is given in the back of the book. The directory also includes the subscribers living in Albany, Corvallis and Oregon City.

Last Week's Hearing on Proposal to Sell Illinois Tunnel Co.'s Telephone Franchise in Chicago.

On Thursday of last week another hearing on the proposed sale of the Illinois Tunnel telephone franchise took place before a committee of the Chicago City Council. Arguments were made by Mr. Critchfield, representing the International Independent Telephone Association, and by President B. E. Sunny of the Chicago Telephone Company. Briefs were presented for the further consideration of the committee.

Long-Distance Day in Western New York

Probably the most broadly planned and admirably executed project for advertising Independent long distance service ever carried out was that put in force by the Federal Telephone & Telegraph Company last week throughout its entire system covering western New York State.

Briefly stated, the idea was to set aside, Friday, May 28th as "Long-distance" day and on that day every manager, special agent, solicitor, collector, book-keeper, clerk, chief operator, long distance operator and every other employee of the the Federal Telephone & Telegraph Company, and its subsidiary companies, who met the public, devoted his or her entire time to the development of the long-distance business.

The circular sent out from the headquarters of the company outlined the plan of campaign as follows: "It is my desire that no other work be done on that day. I do not want any money collected. I do not want any contracts taken or entries made in books or any of the ordinary routine work carried on. I want our employees to come to the office with their minds entirely on this particular branch of the business. I want each exchange manager to lay out his district among his employees, so every long-distance user may be called upon, preferably in person, but, if this is impossible then by telephone. Each of these long-distance users should be thanked for the business he has given, and a brief statement, to the point, should be made to him as to the advantages in using our long-distance lines. These lines should be referred to, in every instance, as long distance and not "toll."

"The day, in fact, will be treated as a holiday from all duties except those of advancing the long-distance service of this organization.

"We do not give enough time or thought to this end of the business, and now that the exchange and long-distance service is being made into one organization, through the Federal Telephone Company, it is imperative that each manager devote as much of his time to the development of the long-distance business as he does to his exchange.

"I want each manager to give this plan his careful consideration, and shall be pleased to have any suggestions of more novel methods of bringing this day particularly before the public, the purpose being to give it wide spread notice to all long-distance users, so it will be remembered by them for a long time to come.

"I want every employee to enter into the spirit which has prompted the special 'Long-Distance Day' with an earnest endeavor to make many new friends to that branch of our service and to pave the way for an increase of the business originating at his exchange."

In order to insure proper publicity in the newspapers the following advance news item was distributed to all the newspapers through the entire territory, numbering hundreds of towns:

"One of the most novel and interesting methods of attracting the attention of the public to the practical use of the Independent telephone will be put into effect on Friday, May 28th, by the Federal Telephone & Telegraph Company.

"The company connects, through its long-distance lines, over 800 towns and villages, serving upwards of 90,000 Independent subscribers in Western New York alone. Its long-distance lines connect with the Independent long distance companies of Pennsylvania and Ohio. Through this extensive and well equipped long-distance system, it is able to render to the public a thoroughly up-to-date and efficient service.

"All of the employees, who are directly engaged in operating the telephone lines, number nearly one thousand and this army of enthusiastic workers will, on Friday, May 28th, devote the entire day to soliciting long-distance business. This day will be called "Long-Distance Day." No other business will be attended to by the employees, and it is estimated that fully 50,000 Independent telephone users will be called upon that day, either by telephone or personally, in reference to long-distance service."

Not only was "long-distance day" advertised in the newspapers and by personal solicitation of employes provided with silk badges bearing the words "Long-Distance Day, May 28th, 09, Federal Telephone & Telegraph Company," but all subscribers received a printed circular letter of four pages, the two inside pages being covered with a map showing the entire long-distance system of the company,

extending from Erie, Pa., on the west to Binghamton, N. Y,. and Syracuse on the East, and from Lake Ontario down into northern Pennsylvania on the south. The first page of the circular contains the following:

"The Federal Telephone & Telegraph Company in order to bring its Long Distance business prominently before the public has set aside May 28th as "Long-Distance Day," to be devoted exclusively to talking "Long-Distance Service" to all its subscribers.

"Over 1,000 employes of the Federal Company will, on this day, talk, via telephone on personally, with nearly 50,000 telephone users in this state, telling them of the many advantages in the 'Independent' Long-Distance service.

"Competition has brought the cost of telephone service within reach of all. It has made it possible for the public to secure long-distance service at rates from 40 per cent to 70 per cent less than in the days of monopoly—it has made it more economical to telephone than to telegraph and, in considering the immediate reply and the time saved, it is cheaper to telephone than to write.

"The wonderful facilities afforded by the Independent exchanges of New York State and the tremendous development and extent of the Long-Distance service is highly appreciated by those who use it, but the growth of the business has been so rapid the public in general has not had time to fully acquaint itself with the vast territory covered in the Long-Distance service.

"The accompanying map shows the development of this service in Central and Western New York, comprising 2100 miles of toll lines with about 20,000 miles of wire, reaching 1896 towns in Western New York, Pennsylvania and Ohio. These lines are well built and equipped with full metallic copper circuits (which insure clear transmission) and afford almost exclusive connection to over 200,000 telephones or nearly 1,000,000 telephone users in this section.

"In any line of business where despatch and efficiency are such important factors as in the telephone, the public is greatly benefited in the maintenance of a keen competition, which is so necessary in the establishment of good service at the lowest possible rates."

The last page bore prominently the Independent "Shield" with the motto, "Look for the Shield," and the same words as the badge worn by the employees. At the foot of the sheet was the sentence. "In bringing the merchant in close touch with the rural communities, the Independent telephone has afforded a greater public benefit than any other public utility."

This advertising campaign was vigorously carried out as planned, and the people in the territory reached by the company's lines not only responded in a substantial way by using the lines, but expressed uniformly favorable comments in the enterprise shown by the company. Reports from all exchanges announced it a success. Several original innovations were carried out by individual managers. At Ithaca, N. Y., Manager R. B. Fegan decorated the trouble wagon, automobile and other vehicles with streamers bearing the words "Long Distance Day," etc., and attracted a great deal of attention.

At Hornell, N. Y., automobiles were decorated with streamers, and carrying the relief operators, thoroughly covered the town. This was also done at Fairport.

A further report of results will appear in a future issue of TELEPHONY, but information already at hand shows that the plan was a success, and the Federal Telephone & Telegraph Company cannot receive too much praise for having given so convincing a demonstration on a large scale, of the value of publicity for long-distance business.

Monopoly Breeds Dissatisfaction at Houston, Texas.

The *Chronicle,* of Houston, Texas, has been printing a long list of specific complaints against the present service of the Bell telephone company. Commenting editorially on the situation, the paper says:

"The real trouble seems to be rooted in monopoly. A few years ago, when the Citizens Telephone Company was an active competitor, the Southwestern Company gave good service. It had to meet competition. The service has depreciated almost in exact ratio to the decline of the Citizens company. Now that the latter company is practically down and out, the Southwestern is treating its patrons with a bold indifference seemingly begotten by absence of competition."

In the Manufacturing Field

Manufacturers' Exhibits at the Missouri Convention.

The attendance of manufacturers' representatives at the Missouri convention, and the character of the exhibits were so notable that they deserve special mention. Among the manufacturers of telephones and switchboard represented were the Stromberg-Carlson Telephone Manufacturing Co., Kellogg Switchboard & Supply Co., Dean Electric Co., Cracraft-Leich Electric Co., Automatic Electric Co., North Electric Co., Monarch Tel. Mfg. Co., L. M. Ericsson Telephone Manufacturing Co., American Electric Telephone Co., and the Century Telephone Construction Co. This latter company was fortunate in having in charge of its exhibit Mr. M. L. Golladay, retiring president of the Missouri Association, and his presence during part of the time, was a factor in keeping the room full of interested visitors. The exhibit included common battery telephones, switchboards, tools, supplies and a working circuit of the company's direct current four-party selective system.

Among the representatives from headquarters of the manufacturing companies were Mr. R. H. Manson, general sales manager of the Dean Electric Co.; Mr. Klas Weman, general manager of the L. M. Ericsson Telephone Manufacturing Co.; Mr. F. J. Dommerque, general representative of the Stromberg-Carlson Telephone Manufacturing Co. and Mr. O. M. Leich, chief engineer of the Cracraft-Leich Electric Co. Mayor J. B. Chance, of Centralia, Missouri had an attractive exhibit of lightning arresters and other supplies. The Everstick anchor and the Matthews' anchor were neighbors in the corridor. The former was shown by Mr. Blackburn and the latter by V. L. Crawford, the genial representative of W. N. Matthews & Bro. Other companies represented were the Illinois Electric Co., Peirce Specialty Co., Frank B. Cook, with a large display of protective apparatus in charge of Mr. J. F. Thompkins, National Pole Co., Homer Roberts Co., L. K. Deal Lumber Co., National Carbon Co., Page & Hill Co., and B-R Electric Co. Mr. Fred P. Hale, of the Corcoran Wipe Joint Co., explained the merits of his machine for wiping cable joints, and was only prevented from presenting practical demonstrations by his inability to secure space for his exhibit.

The Never-Slip Wire Grip.

As the invention of practical telephone men, who have given it a thorough trial in their own exchange system be-

fore ever putting it on the market the "Never-Slip" wire grip has particularly strong recommendations to the attention of telephone managers and construction men. The accompanying illustration shows what a strain can be put upon it without causing it to go back on its name.

This grip was developed and patented by Messrs. Geo. H. Glass and Geo. A. Vint, both of Pekin, Ill. Mr. Glass is general manager of the Citizens' Telephone Company of that city and Mr. Vint is its superintendent of construction. He has been associated with Mr. Glass in telephone work for the past fourteen years, and has a first class reputation as an all-round telephone man.

Mr. Glass is well known throughout the country on account of his long connection with the Independent telephone business, and his contributions to the technical press. His telephone experience began at Richmond, Va., in 1882, with the Southern Bell Company and he has been an Independent telephone man since 1897. He has occupied the position of general manager of the Citizens' Telephone Company for the last eight years. After developing his wire grip, he interested some of the best known men in his city to assist in putting it upon the market. It is now handled through the Union Electric Manufacturing Company, of which Mr. Glass is president, Mr. Vint vice-president, and J. W. Barrett, secretary and treasurer. Mr. Barrett is the president of the Citizens' Telephone Company, of Pekin. Another director is Mr. H. G. Hergert, a banker and also owner of the Pekin electric light system; and a fifth director is Mr. R. P. Turner, president of a large grain company.

The construction of the "Never-slip" wire grip is so simple that it may be readily understood from an examination of the illustration.

Mr. Glass refers to its development as arising from a practical need which he himself experienced. He had observed that many times, when heavy construction is under way, a number of high priced men are employed on the job. While a small grip or three bolt clamp is being arranged to make a pull, one or two of the men would be doing the work while the rest would be standing around idle. The "Never-slip" can be adjusted in five seconds, and taken off with equally good speed. One of the principal claims for the grip is that it can be used when and wherever a great strain must be applied without damage to the wire. A groove in which the wire is inserted is 4½ inches long. When the wire is in place a wedge shaped tongue is adjusted between the two joints, and as the strain is applied at the opposite end from the object to he pulled, the wedge falls into the groove and puts the tension on the wire to be pulled.

In the construction of the grip there are no rivets to strain and break, and, in fact, no joints of any kind to get out of order. The grip is made in two pieces for any size from No. 14 wire to a 1-inch strand.

The demand for this grip has already reached considerable proportions in the United States and Canada, and the people who have used it express their hearty approval of the device.

Practical Test of the Never-Slip Wire Grip.

Monarch Direct Current Selective System.

In the Monarch Telephone Manufacturing Company's advertisement in our May 29th issue, a typographical error was made.

In the Monarch direct current selective system false rings are eliminated not only by the reliable principle upon which the ringer operates, but an extra precaution is taken by short-circuiting the inoperative side of the line through the ground.

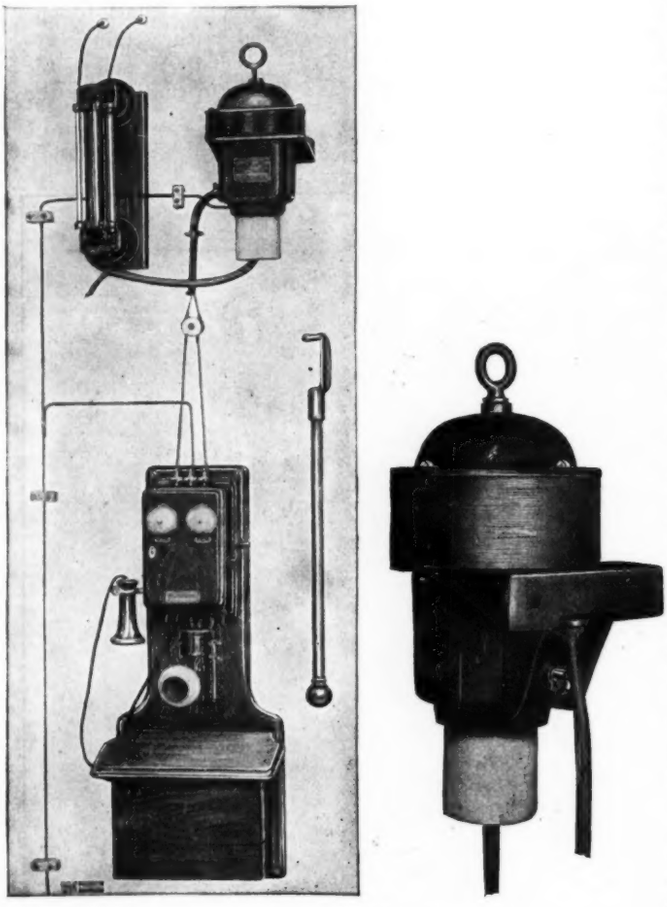
In pointing out this feature the paragraph incorrectly printed should have read as follows:

"Put a combination of these two ringers (a negative and a positive) on each side of a telephone line. Feed negative or positive battery on one side of the line—at the same time short-circuiting the other side of the line through the ground—and you have the Monarch Direct Current four-party system."

Insulating Transformer for Telephone Lines.

An insulating transformer for use on telephone lines running near high tension wires has recently been placed on the market by the General Electric Company. The purpose of this transformer is two-fold:

First. To safeguard the users of telephones from the dangers of high voltages due either to induction, or accidental



The Telephone Transformer and Method of Installation.

contract between telephone and power lines, where these lines are on the same pole, or upon a parallel adjacent line of poles.

Second. To improve the telephone service by removal of the ordinary small ground gap carbon arrester from direct connection with the line, as well as improvement through better insulation by removing the interior wiring, instrument, batteries, etc., from direct line connection.

Special attention has been given to the electrical and mechanical design of the transformer; the high frequency talking currents are transformed with small loss, while at the same time the magnetizing current, which must be supplied by the ringing generator, is very small. Tests show that the magnetizing current taken by this transformer is about half the current passed by a standard 1,000 ohm bell. As is shown in the illustration, the insulating transformer is assembled in a weather-proof iron case and may be instatlled out of doors in any convenient place.

In designing this transformer the insulation has been considered of primary importance. A high potential test between windings of 25,000 volts for one minute is given to each transformer before shipment. The high insulating quality assured by this test makes the transformer a sturdy piece of apparatus under ordinary conditions of operation, but the best protection is afforded when it is installed with a combined switch, fuse and lightning arrester. This combination affords the greatest safety to both the telephone instruments and the user, even in the most extreme cases when the telephone lines come in actual contact with a high tension power circuit.

The switch, fuse and lightning arrester combination recommended for this service is at the top of the illustration, the whole being mounted on a base of insulating material. The long handled insulated hook in the center of the illustration is used to pull the switch open when it is desired to disconnect the telephone and transformer from the line. The arrester is hinged at the bottom, the insulated hook engaging with a ring at the top of the arrester. The usual form of carbon arrester with mica separation is used to protect the winding of the transformer against any abnormal difference of potential which might accidentally exist between the telephone lines. This arrester is connected across the terminals of the transformer, but is not connected with the ground.

An adjustable gap arrester is connected between the telephone lines and ground, the function of this arrester being to take care of lightning discharges and in case of actual contact with high tension lines to arc over and blow the fuse, thus disconnecting the transformer and telephones from the line. Should a ground occur on the adjacent high tension line, the voltage induced on the telephone line will not materially interfere with the service, provided the line is sufficiently well insulated. The adjustable air gap is set just beyond the point where this induced voltage will arc across.

Tests on a 30,000-volt transmission line in actual operation showed that a ground on one phase of the transmission system induced a potential on the telephone line of approximately 7,000 volts, measured between telephone line and earth. Notwithstanding this high induced voltage on the telephone line, it was possible to use the telephone when the transformer was installed. The line was somewhat noisier than under normal conditions, but not so noisy as to prevent comprehensible conversation.

THE SWEDISH-AMERICAN TELEPHONE COMPANY, Chicago, Ill., has, in its new catalog a striking exposition of the quality and variety of its product. Not only are the illustrations large and well executed, but they cover a wide line of switchboards and telephones and show comprehensive views of the large modern factory in which they are made.

THE NATIONAL TUBE COMPANY, with general sales offices in the Frick building, Pittsburg, Pa., is sending out to the trade an interesting and handsome catalog describing and illustrating the Shelby Cold-Drawn Seamless Tubes. The catalog contains an interesting account of the manufacture of the seamless tubes from beginning to completion of the work, and illustrates the various kinds manufactured.

IWAN BROS., South Bend, Ind., are sending out artistic calendars especially adapted for office walls. The calendar is issued at this time because many companies still address the firm at its former location in Streator and it is hoped that this will be avoided by having the new address upon the calendar; any man who gets one will want to keep it where he can see it.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY has issued another of its popular post card bulletins describing the No. 896 type magneto wall telephone. The various features of the set are illustrated and described and all information regarding method of ordering and shipping is also given. A third part of the card contains an order blank which may be used in ordering this set.

The Ashby No-Risk Lightning Arrester.

Another patent was issued last month to the W. E. Ashby Telephone Cut-Out Company of Chariton, Ia., on the "No Risk" lightning arrester and telephone cut out. The company states that during the five years the arrester has been in use, it has not received a report of a telephone burning out where its arresters were placed and operated according to directions.

The company has issued a booklet, "Telephones and Lightning," which is of especial interest now that the season when lighting does so much damage to rural telephones, is at hand. It will be sent to those interested upon request.

A New Messenger Wire Support.

The accompanying illustration shows the latest invention of Mr. S. D. Levings, engineer with McMeen & Miller. Mr. Levings has assigned this device to Frank W. Pardee, manufacturer of the Paragon specialties, and it will be known as the Paragon never-slip messenger support.

The principal features of the Paragon support are the separate clamping effect afforded by the machine bolt and its adaptability for installation by means of a ⅜ in. by 5 in. lag screw, for suspending strand carrying cables up to two hundred pairs capacity.

The separate clamping effect eliminates the trouble which is frequently found in the aerial cable plant caused by the riding of the messenger wire through the supports, thus straining the cable at the end terminal as well as at intermediate points along the lead. Particular attention has been paid to the design so that the clamp may be screwed to the pole by means of a lag screw, in place of the through bolt which is commonly used with other types of supports. That the boring of a hole entirely through the pole weakens it, is well known and this hazard was the prime cause for substituting a lag screw.

The Paragon messenger support does not weaken the pole in the slightest degree due to the fact that it uses only one lag screw. The messenger wire is clamped by an entirely independent bolt as can readily be seen from the illustration. The four teeth of the support bite into the pole and, it is said, absolutely prevent misplacement by a twisting torque. These teeth also act as lags, thus affording maximum clearance between the largest aerial cables and the pole.

The device is made of heavy malleable castings thoroughly galvanized by the "hot dip" process. The bolt and nut are also galvanized. It is simple and very efficient and is, it is claimed, very reasonable in price.

The support has been in use for some time and very favorable reports have been received. It is made in but one size, but is adapted to the suspension of No. 4 steel messenger, ⅜ in. or ½ in. strand, the clamping slot being modified for the three sizes.

A New Steel Tie and Splicing Wrench.

A new wrench has just been placed on the market to be used to "tie in" the line wire to the insulator. In practical use the wire already bent into the customary U shape is slipped over the insulator with the open end of the U resting on the line wire. One of the ends of the U is then slipped

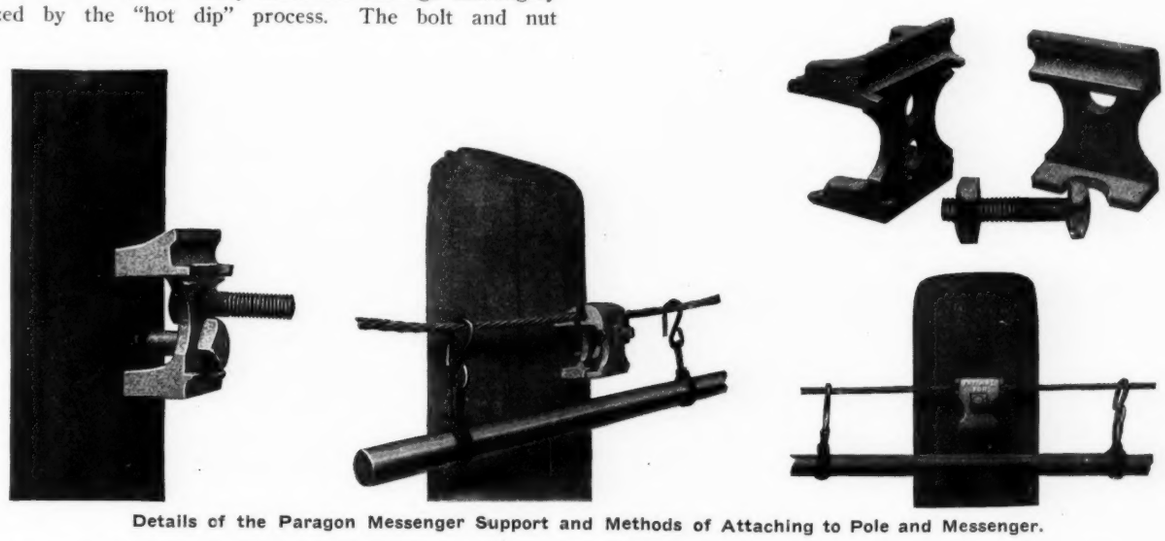
The New Klein Tie and Splicing Wrench.

through the hole in the eye of the wrench and the tool pushed back against the line wire. By a rotary movement of the wrench around the line wire, the tie wire is curled around the line wire in the form of a helix. The other end of the U tie wire is then treated in a like manner, fastening the line wire permanently about the insulator. Ordinarily the linemen do this work with pliers but this new wrench saves a great deal of time and makes a clean solid job without any danger of nicking the line wire.

The splicing end of the tool is intended for use in connection with a splicing clamp. The ends of the wire to be connected are held with the splicing clamp and the projecting end is caught with the shoulder of the wrench. By turning the wrench around continuously, it will coil the wire tightly and evenly on the line wire, making a clean tight splice. The wrench is 7 inches over all in length and is made for use with both copper and iron wire. It can be used for splicing iron wire of 4, 6, 8, 9, 10 and 12 gages and numbers 2, 4, 6, 8, 10 and 12 gage copper wire. This device is manufactured by Mathias Klein & Sons of Chicago, Ill.

THE DEAN ELECTRIC COMPANY recently sold a 500 line common battery multiple switchboard together with the power and terminal apparatus to the West Shore Telephone Company of Lemoyne, Pa.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, N. Y., has been awarded a contract by the Louisville Home Telephone Company to make modifications and changes in its main exchange switchboard for providing additional apparatus for giving two-party selective service. Each of the seventy regular "A" positions and four trunking positions are to be re-equipped with two-party keys. Provisions are to be made so that four-party equipment may be installed at some future date. With this contract an order was also given for two ringing machines of the Holtzer-Cabot composite multicycle ringing type.



Details of the Paragon Messenger Support and Methods of Attaching to Pole and Messenger.

American Electric Telephone Company's Orders.

Recent shipments of the No. 45 Burn's Express swkitchboards in the standard 150 drop size, are reported by the American Electric Telephone Company of Chicago, to the following places: Nashville, Ill., Ralston, Okla., Mineola, Ia., Wilmore, Ky., Greentown, Ind., Newton, Ky., Nashville, Ga., and Dundurn, Sask., Can. The "Line Ring Off" feature of the cord circuit of this type of board is meeting with a great deal of favor.

The company states that the Burn's adjustable telephone bracket is being used in a great number of exchanges and letters are received frequently telling of its value.

The No. 48 pressed steel telephone set is appealing to many practical telephone men on account of its many up-to-date features.

The American No. 43 desk stand has found a particularly large sale due to a great extent to the convenient arrangement of the parts for examination. That the stand is proving satisfactory to its users is shown in the continued orders from large purchasers. A second order for 500 stands was recently received from one operating company.

A New Glass Transmitter Mouthpiece.

Stromberg-Carlson Telephone Manufacturing Company of Rochester, N. Y., has entered into the fight against tuberculosis by placing on the market a sanitary glass mouthpiece which can be fitted to any Independent telephone transmitter.

For some time there has been a demand for some kind of a mouthpiece to take the place of the rubber and composition one, and this sanitary glass mouthpiece, it is claimed, will meet every requirement, and has met with great approval by a large number of operating companies.

It can be taken off the transmitter and washed, and shows every bit of dirt that gathers on it. Each mouthpiece is thoroughly tested before leaving the factory and is mechanically perfect. The threaded cup that screws to the transmitter and the glass part of the mouthpiece are cast together, thus making one solid piece.

Any of the Stromberg-Carlson Telephone Manufacturing Company's offices will be glad to send a sample and give other information regarding this mouthpiece.

The Stromberg-Carlson Glass Transmitter Mouthpiece.

LLOYD E. KNAPP & Co. is the designation of a new firm, organized by Lloyd E. Knapp, at Houston, Tex., to conduct the business of contracting and constructing engineers. The company will handle telephone, light and power propositions. At present Mr. Knapp is engaged at Brady, Tex., upon the work of rebuilding the system of the Brady water and light company, after having secured the contract after making a complete report on the requirements for bringing the plant up to a proper state of efficiency.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. SAMUEL B. FOWLER has resigned his position as engineer of the Sterling Electric Company, of La Fayette, Ind. Mr. Fowler has held this position for many years, during which time he has invented three different common battery systems, each noted for the simplicity of its cord circuit. He has been active along many lines of telephone design, in which he has shown great skill and thoroughness. His plans for the future have not been stated.

NEW COMPANIES.

PHOENIX, ARIZ.—Twenty-five leading citizens of Phoenix met recently and organized a company to be known as the Home Telephone Company. The company is capitalized at $100,000. The system will be built to accommodate 9,000 telephones and the rates will be considerably less than those charged by the company now operating. The merchants are all very enthusiastic in their support of the Independent company. The wires in the downtown district will be in underground conduit and in other parts of the city aerial cable will be used. The directors elected are, Walter Bennett, Charles Goldman, Frank Alkire, Dwight B. Heard, H. S. Wakelin, Dr. J. W. Foss, Walter Talbot, C. H. Davidson, P. T. Hurley, O. E. Plath, John Lentz, C. D. Dorris, Barry Goldman, C. H. Pratt and Charles Korrick.

BARDSTOWN, ARK.—The Bardstown Telephone Company has been incorporated with a capital stock of $2,000. The incorporators are, J. M. Ward, president and treasurer; L. L. Ward, vice-president; H. S. Portis, secretary.

SAN GABRIEL, CAL.—The San Gabriel Valley Home Telephone Company has been incorporated with a capital stock of $200,000, and H. F. Metcalf, H. V. Carter, Edgar O. Fawcett, E. E. Bailey and W. M. Northrup are the incorporators.

TURLOCK, CAL.—A new corporation to be known as the Farmers' Union Telephone Company has been organized with its headquarters at this place. The directors are A. Hallner, J. P. Snygg, C. A. Lundell, August Warn and Aaron A. Anderson, of Hillmar Colony, and Peter Erickson and Claus Johnson, of Turlock. The company is capitalized at $25,000 and its first move toward construction will be the building of about 60 miles of lines radiating in and around Turlock. The capital stock is placed at $25,000.

BIG ROCK, IOWA.—The Big Rock Telephone Company has been incorporated by Geo. Knapp, H. W. Kebe and G. A. Barron.

MARION, KAN.—An organization to be called the Marion Mutual Telephone Company was recently incorporated. J. B. Shields was installed as chairman, Taylor Riddle, secretary and John Gilbert, Taylor Riddle, R. Williams, H, J. Buschlen and George Thompson were chosen as directors.

HEATH, KY.—Articles of incorporation have been filed by T. M. McGee, O. W. Murphy, A. P. Hill, J. D. Rives, F. M. Kelley, F. V. Kimbrough and A. W. Rickman for the Heath Telephone Company.

PIPESTONE, MINN.—The Altona-Fountain Prairie Rural Telephone Company has been organized to construct lines from Luctor to Verdi and Pipestone. A. E. Harris is president; G. Luschen, vice-president; C. H. Warrick, secretary, and P. Mantel, treasurer.

GREAT FALLS, MONT.—The Smith River & Castner Coulee Telephone Company was organized recently at a meeting at Truly, with H. B. Ellis as president; I. K. Huntsberger, vice-president; Everett L. Hall, secertary, and C. E. Hoag, treasurer. Directors, F. G. Givens, D. H. Evans, and F. O. McDonagh. The lines will be built along the Missouri river to Flood and then across the river to Truly and from there one branch to Castner Coulee and the other along Smith river to Hound creek. Work will begin as soon as material is procured.

GLEN RIDGE, N. J.—The Telegraphatype Company has been incorporated with a capital of $5,000 to build and maintain tele-

phone and telegraph lines. The incorporators are W. M. Beard, Glen Ridge; W. F. Paret, Essex Falls; M. V. Moran, Jersey City.

SPENCERTOWN, N. Y.—The Spencertown Co-Operative Telephone Company has been incorporated with a capital of $1,000 by Henry W. Niles, of Chatham, N. Y., and Derett O. Sawyer and David W. Lasher, Spencertown.

HERTFORD, N. C.—The Belvidere-Hertford Telephone Company has been organized with a capital stock of $1,000 by L. W. Norman, G. W. Gaither and W. G. Gaither, Jr.

VELVA, N. D.—The Progressive Farmers Telephone Company has been incorporated by George F. Milles, H. F. Harms, M. E. Bowers and others. The company is capitalized at $50,000.

BEDFORD, PA.—The Friend's Cove Telephone Company, with a capital of $10,000, has been incorporated. Samuel Cessna, R. F. D. No. 4, Bedford, is the treasurer of the company. The directors are: C. P. James, Rainsburg; John C. Koontz, D. P. England, Everett, R. F. D. No. 2; S. T. Diehl, Charlesville; Clayton Smith, and M. A. Diehl, R. F. D. No. 4, Bedford

INDIANA, PA.—S. A. Jones, J. T. Cass, A. J. W. Robinson, E. J. Smith, J. H. Henderson, J. F. Hood, T. C. Hood and J. T. McLaughlin will make application for a charter for the incorporation of the Elders Ridge and West Lebanon Telephone Company.

JACOBUS, PA.—The Jacobus Telephone Company has recently been organized at this place. The officers are: President, G. M. Wolf; secretary, Charles A. Williams; treasurer, L. J. Innerst. Directors, H. G. Yost, H. A. Kohler, G. M. Leader, Henry J. Hess and Frank J. Beck.

MILL HALL, PA.—(Centre Co.)—The Mill Hall and Nittany Telephone Company has been incorporated. W. H. Pifer of Lock Haven is the treasurer and the company is capitalized at $5,000.

LITTLE BEND, S. D.—A new telephone company has been organized to connect this place with Onida the county seat. The line will be about thirty miles long. The officers of the new company are: President, H. P. Knox, Little Rock; secretary, W. E. Jenkins, Okobojo; treasurer, M. L. French, Onida.

MINERAL WELLS, TEX.—The Crystal City Telephone Company has been incorporated with a capital of $40,000. Incorporators are Louis Phelan, Thomas J. Jordan and Hugh F. Wagley.

KATY, TEX.—The Katy Telephone Company has been organized by L. W. Clardy, W. H. Wheeler, G. W. Douglas, Guy Hubler, J. Post, Dr. M. Stewart, John Wright, J. Alt, M. James J. Cabanise and Mr. Bartlett. The lines of the Katy Mutual Telephone Company will be connected to the board. The construction work is now progressing and is expected to be completed shortly.

ALAMENA, WIS.—The Alamena Farmers' Telephone Company has been incorporated with a capital stock of $8,000.

ABERNETHY, SASK., CAN.—The Pioneer Telephone Company has been incorporated with Elmer Shaw as president and Arthur Beamen, secretary and treasurer. The company will build several long distance lines this year.

ODESSA, ONT., CAN.—The Ernestown Rural Telephone Company has been incorporated. Mr. J. F. Dawson is one of the interested parties.

FINANCIAL.

BIRDSBORO, PA.—The stockholders of the Conestoga Telephone & Telegraph Company have increased the capital stock of the company from $15,000 to $40,000. At a meeting of the directors a semi-annual dividend of 3 per cent was declared.

RALSTON, PA.—The Ralston Telephone & Telegraph Company has increased its capital stock from $12,000 to $30,000.

HILLSDALE, WIS.—The Hillsdale Western Telephone Company has increased its capital stock from $2,000 to $5,000.

NEWTON, WIS.—The English Lake Telephone Company has filed an amendment to its articles of incorporation increasing the capital stock from $21.000 to $42,000.

FRANCHISES.

PHILLIPSBURG, KAN.—An ordinance has been passed by the authorities in this place, granting the Farmer's Union Telephone Company a franchise.

CONSTRUCTION.

BELVIDERE, ILL.—The Belvidere Telephone Company is extending its lines to Cherry Valley and will thus secure more direct communication with Rockford.

WILLIAMS, IA.—A switchboard is to be installed at this place by the Ellsworth Telephone Company.

ARMA, KAN.—The Arma Telephone Company is now working on a line from this place to Englevale.

MT. STERLING, KY.—The Old Kentucky Telephone Company, which recently secured a franchise here, has begun the construction of a modern metallic telephone system. A building, which is to be erected for exchange purposes, has been leased and a switchboard costing about $6,000 will be installed. A cable system will also be installed. It is estimated that the work will cost about $15,000.

ST. LOUIS, MICH.—The Union Telephone Company has made plans to install a complete cable system in this city, and material has been ordered. All the old lines will be taken down and toll lines will be run around the city instead of through it as heretofore. The improvements will cost about $20,000.

FAIRMONT, N. D.—The Fairmont Rural Telephone Company will soon construct about three miles of line.

GLENBURN, N. D.—The Lone Star Telephone Company will soon construct about 20 miles of rural lines.

WILLISTON, N. D.—J. J. Delaney and H. C. McCartney will spend about $40,000 in new equipment and extensions of the toll lines in connection with their local exchange.

BERNVILLE, PA.—The Myerstown and Bethel Telephone Company has located its exchange in the Schock building and a new switchboard has been installed. A new line is being built to Centerport along the Penn Valley and one will also be built to connect with North Heidelberg.

BROWNWOOD, TEX.—The West Texas Telephone Company has been granted a permit to build a two story brick office and local telephone exchange in this place. The company will also put in new and larger cables.

CLARKSBURG, W. VA.—A complete new plant with improved service in other ways is one of the plans of the Consolidated Telephone Company. The equipment is to be modern in every respect. The Consolidated company has also signed contracts with the B. & O. R. R. whereby the railroad will use its telephones exclusively.

CRANBROOK, B. C., CAN.—The Kootenay Telephone Company, Ltd. will start the construction of several long distance lines within a few weeks, surveys for which are now being made.

EDMONDTON, ALTA., CAN.—Hon. W. W. Cushing, minister of public works, is at present making a tour of American cities inspecting the various automatic telephone systems in operation. The Alberta Government is considering the installation of an automatic system throughout the province.

WINNIPEG, MAN., CAN.—The Manitoba Telephone Commission is engaged in stringing another copper telephone wire between this place and Portage la Prairie.

ELECTIONS.

FAYETTEVILLE, ARK.—Officers elected to serve the Oxford Telephone Company are: C. E. Oxford, president; H. H. Tittman, vice-president; W. N. Gates, secretary, and W. H. Morton, treasurer. With the exception of W. N. Gates, the above, together with Charles Richardson and E. B. Harrison, constitute the board of directors.

FREEPORT, ILL.—The annual meeting of the Stephenson County Telephone Company was held recently and the old officers were all re-elected as follows: President, D. C. L. Mease; vice-president, W. A. Hance; treasurer, E. T. Morse; secretary and manager, L. A. Herrick. The directors are T. K. Best, Chas. D. Knowlton, Wm. O. Wright, F. A. Read and Douglas Pattison.

KINGSTON, MINN.—The annual meeting of the Kingston and Forest City Telephone Company was held recently at which time officers were elected as follows: Matt Flynn, president; E. D. Harris, vice-president; Wm. Murphy, secretary; Thomas Farley, Michael Hannon and John Whalen directors.

SCHENECTADY, N. Y.—The stockholders of the Home Telephone Company held their annual meeting recently and officers were elected as follows: Charles F. Veeder, president; Irving H. Griswold, vice-president, and J. C. McDonald, secretary-treasurer.

MISCELLANEOUS.

NEW YORK, N. Y.—The Public Service Telephone Company, which was recently organized to do an Independent telephone business in New York City, has filed an application for space in the ducts of the Empire City Subway Company, which has the monopoly of the tube facilities for low tension wires in New York City. The company, which will operate under the franchise of the Long Acre Light & Power Company, intends to install 18 exchanges, which will provide for 160,000 automatic telephones. The capital stock of the company is soon to be increased from $10,000,000 to $25,000,000.

DAYTON, OHIO.—Yor Bosley, an employe of the Citizens' Telephone Company met with a peculiar accident several days ago. A pot of solder, which was being lowered to him from the surface of the ground, into the subway, where he was working, broke from its line and fell to the bottom and the solder splashed up striking him in the face. The solder hardened on his face and hands, but Mr. Bosley sustained no injuries to his eyes from the accident.

RIPLEY, OHIO.—Miss Flora Bartholomew, night operator at the telephone exchange, recently averted what would probably have been a disastrous fire. She was awakened about midnight by coughing and found the room filled with smoke. She groped her way to the instrument and called the manager, who, upon his arrival, found the operator unconscious. The fire was extinguished with small loss.

PROSSER, WASH.—The Benton Independent Telephone Company has purchased the franchise and entire equipment of the Prosser Telephone Company, the change in management taking effect June 1. The development of the Benton Independent Telephone Company has been a rapid and interesting one, The company began operations about two years ago with a dozen farmers, and now has one of the best equipped lines in the Northwest and has over 175 miles of line in operation in this and Yakima counties, beside the cable line in the city.

At The Editor's Desk

A friend of our's wrote a few days ago taking us to task for not "tooting our own horn more", as he put it. We do not know that the work done by our contributors would be appreciated any more if we called attention to it once in a while, but the fact that it is appreciated is shown by the letters we receive from day to day. The gentleman who criticised us for not "tooting" related an instance of the practical value of the paper to himself, saying:

"I cannot help but feel that ofttimes you do not realize what a world of information TELEPHONY contains. The other day I had several matters to look up in connection with an application for letters patent. A search of the patent office did not disclose any anticipation of the device, although I felt quite sure that something of this character had been in general use. I took some volumes of TELEPHONY, started a search, and in Vol. 8 located a description and cut of a device clearly anticipating the pending application. This information undoubtedly saved my clients from the trouble and expense incidental to securing a patent, which even if it had been allowed would not have been of any value owing to the previous state of the art.

"I have never noticed when TELEPHONY 'blew its own horn' in connection with matters such as this, and would also say that owing to the general character of the telephone information contained in the paper, it is of more general value to any one connected with the business than all other books or publications."

Of course this letter was especially pleasing, because it shows to some extent that we are accomplishing the project we have in mind, to produce a paper which will be the best investment a telephone man can make. We feel dissatisfied if a subscriber does not receive a great many times the value of the money he spends for his subscription, by obtaining ideas of other men which he can actually put into practice, to make his work more effective and profitable for the company with which he is connected.

The number of contributors to TELEPHONY is constantly increasing, and we believe the contributions not only cover an ever-widening range of ideas, but are showing the improvement in character which is everywhere taking place in the field.

Believing that our readers will be interested in the future as much as we are, we are planning to take up a little space to tell about good things to come in some of our future issues. The History of the Automatic Telephone, which has been so ably presented by Prof. Smith is nearing conclusion, and the space given up to it will be filled partially by a number of interesting articles which we now have on hand, relating to long-distance work and telephone exchange practice. A particularly valuable series of articles prepared by Edmund Land, the well known consulting engineer, is ready for printing and will appear shortly.

We shall be glad to know how many of our readers are filing the articles by Mr. S. D. Levings, which present such interesting methods for carrying out broad plans of telephone exchange design and construction. He takes up this work from the standpoint of an engineer with an exceptionally broad training, and his personal history is interesting.

Mr. Levings, as will be seen from this photograph, is young enough to be a vigorous thinker, and quick in going into action, but although he does not tell his precise age, has been in the world long enough to get a good deal of valuable practical experience. After leaving the public school he entered the Chicago Manual Training School, which was then an isolated institution, but which is now a part of the University of Chicago, and spent two years there. He then went to Armour Institute, where he finished the electrical engineering course in three years, by eliminating a few studies. His first position, that of dynamo tester for the Western Electric Company, was taken in the fall of 1900. Here he stayed for two years, gaining experience in the design and construction of various types of electrical machinery. He was then promoted to the position of Engineer of Tests, which involved the re-designing of machines falling down on test, together with the general supervision of all methods of testing electrical machinery.

After a while he tired of following the monotonous

Mr. S. D. Levings.

routine of a large company, and in the fall of 1903 took the position of chief engineer for the Edwards Railroad & Electric Light Company, where some opportunity was given to give play to his individuality. For this company he designed a factory erected at La Porte, Ind., and then re-designed its entire electric headlight and train lighting system. In 1904 Mr. Levings left this company, and joined the engineering staff of the Chicago Telephone Company. Soon after accepting this employment he was promoted to the position of second assistant to the construction engineer, and finally became principal assistant. While in this position his duties included the writing of specifications for the construction of plant and the writing of all specifications for the methods to be followed by the construction force. He also developed special studies involving questions of construction.

His experience as an operating engineer covered a wide range of practice, and fitted him for a position at more profitable work with McMeen and Miller, with whom he accepted a position as assistant engineer in 1907. After only a few weeks he was chosen to conduct the engineering of a 17,500-line plant in Houston, Tex., for which all the plans had to be made on the ground. His work in Houston not only included the laying out of the complete plant, and drawing the specifications, but general preliminary work, including apearances before the council, etc., and other matters which arise in connection with starting a new exchange. He has also carried on various important studies in telephone engineering while with this firm, and has appeared as an expert witness before the courts.